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COMPUTE!'s PC magazine

FOR IBM PCs AND COMPATIBLES

DISK INSIDE

March 1988

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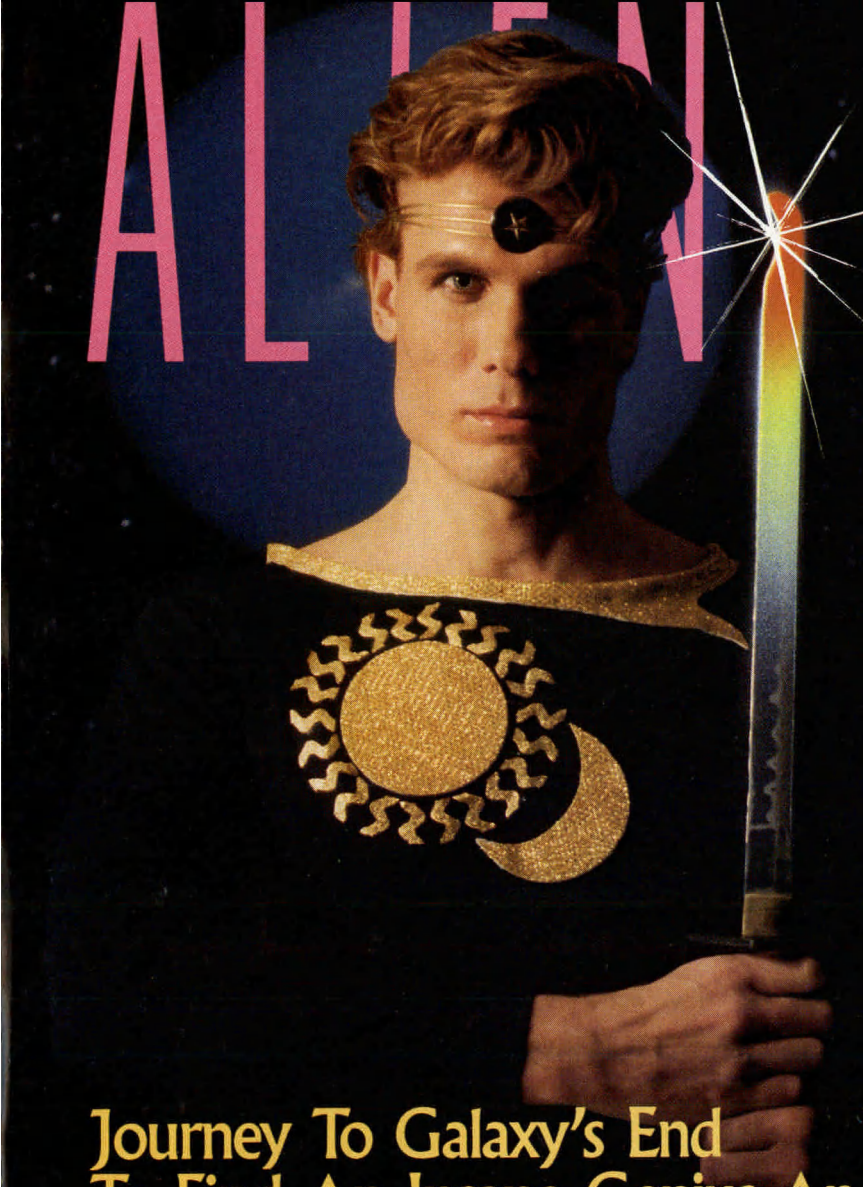

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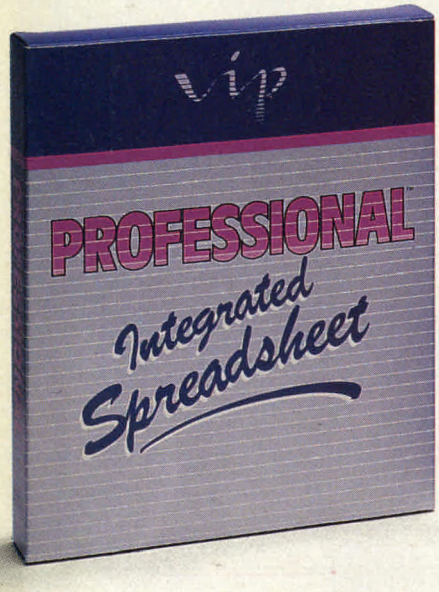

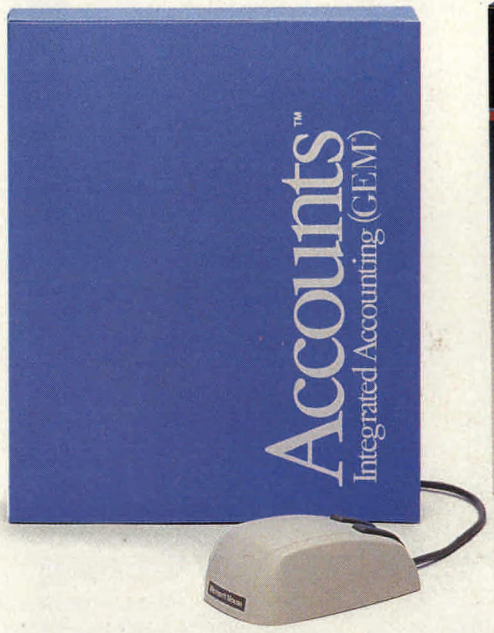

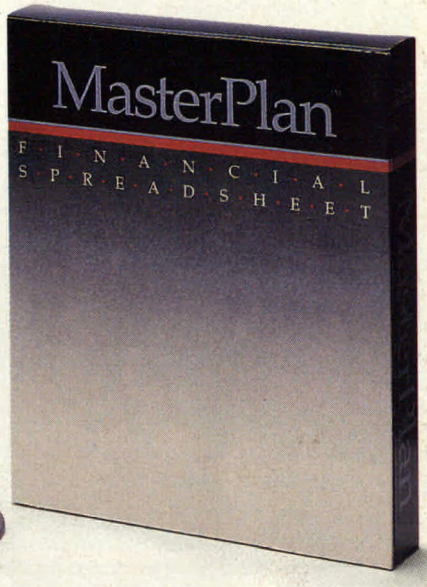

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THE EDITOR'S VIEW

One of the most telling comments on egalitarianism ever written appeared in George Orwell's fantasy novel *Animal Farm*, in which he invented this principle for a society ruled by farm animals: "All animals are equal, but some animals are more equal than others."

Though intended as political satire, the statement has such a ring of truth that it has inspired dozens of variations over the years. Now, shamelessly, here's one more: "All PC compatibles are PC compatible, but some are more compatible than others."

Unfortunately, this variation is more ironic than satiric. It underlines a growing problem in the IBM PC-compatible community: There are so many so-called "standards" that few things seem standardized anymore.

The reason for the great success of the PC, we often hear, is the establishment of the PC standard. This pleases many people who for years wanted a personal computer standard that would make buying a computer as relatively painless as buying a stereo system. Buying a computer *should* be as painless as buying a stereo, and someday it will be. But is there really a PC standard?

Consider that there are at least half a dozen versions of PC-DOS and MS-DOS; half a dozen floppy disk formats; half a dozen major video display standards; half a dozen video monitor standards; at least half a dozen different PC-compatible ROM BIOS chips; and four different central processing units (not counting variations like the NEC V20).

In fact, there are now so many standards that it seems contradictory to refer to them as "standards." It's possible to assemble hundreds of different computer systems out of these myriad components, and that's exactly what people are doing. Thankfully, it's still possible to write a program that runs on all of these possible permutations—as long as the program conforms to the lowest common denominator.

Actually, the success of the PC has more to do with its ongoing evolution than its standardization. If we had locked into the original IBM PC standard back in 1981, today we might all be using computers with 64K memory and single-sided floppy disk drives.

Problems arise when people are lured by the talk of a PC standard and start believing that buying a computer has become as easy as buying a stereo. It hasn't. Some of these people get upset when they learn that games and graphics programs won't run on their monochrome systems unless they buy a new display board and monitor; others wonder why the DOS disk they use at the office locks up the PC compatible they have at home.

Then there's the Orwellian principle that some PC compatibles are more equal than others. With thousands of readers using hundreds of different PC compatibles, we run into this problem, to some degree, in almost every issue. For instance, our November 1987 issue included a chess program written in BASIC. We supplied a compiled version that runs on our IBM PCs and compatibles, plus an uncompiled version that runs on IBM PCjrs. But soon we heard from some readers who couldn't get *either* program to run on *their* PC compatibles.

Commercial software developers hear similar stories. Short of testing every program on every possible machine—obviously impractical—problems like this are inevitable.

The bottom line is to keep these quirks in mind when shopping for a PC, a new piece of hardware, or software. Find out exactly how your computer is configured and make sure the product you want to buy is really compatible. If possible, try the product on a similar system to see how it works. And pray for the day when computer technology matures and everything really becomes compatible.

Tom R. Halfhill, Editor

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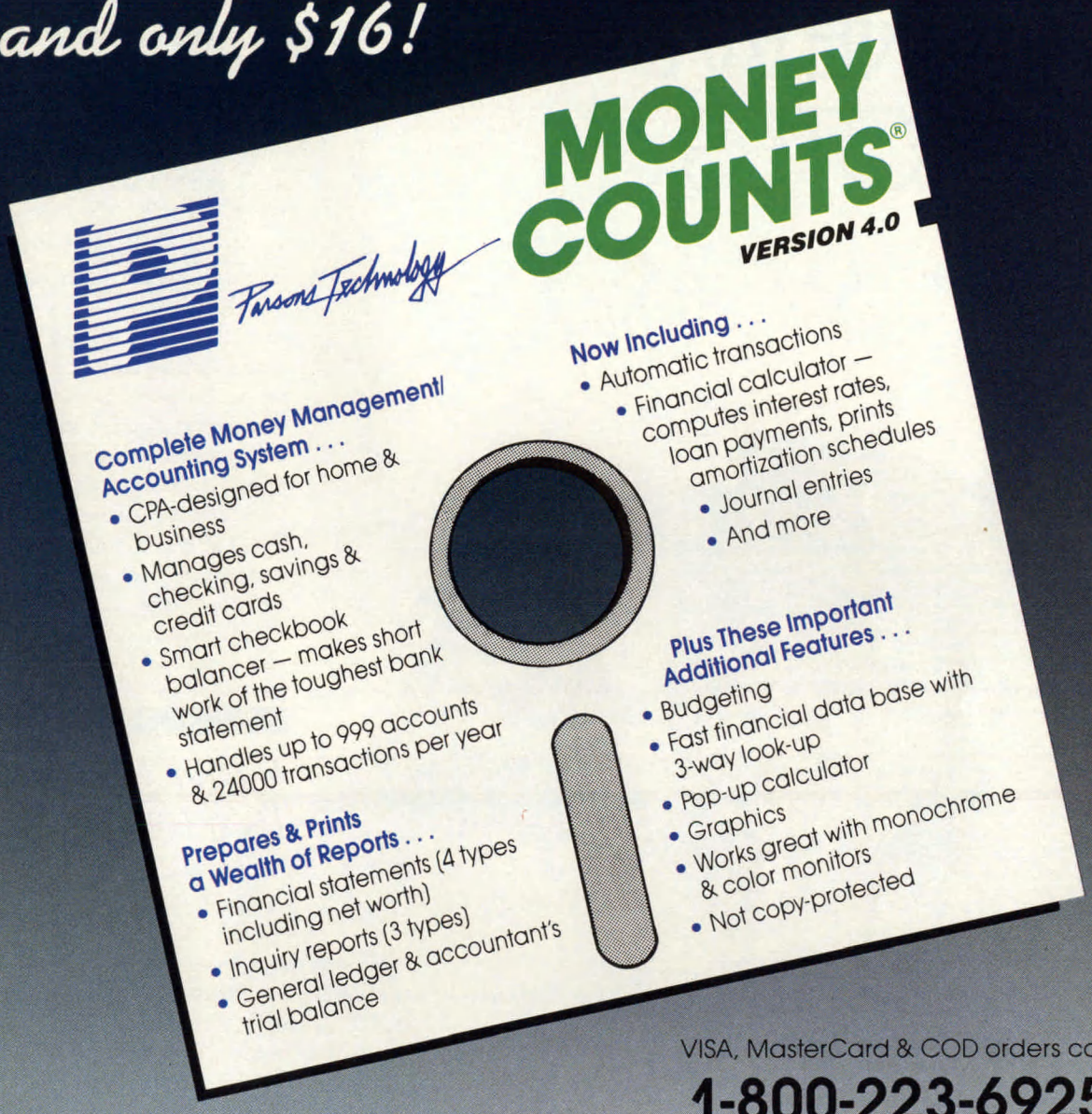
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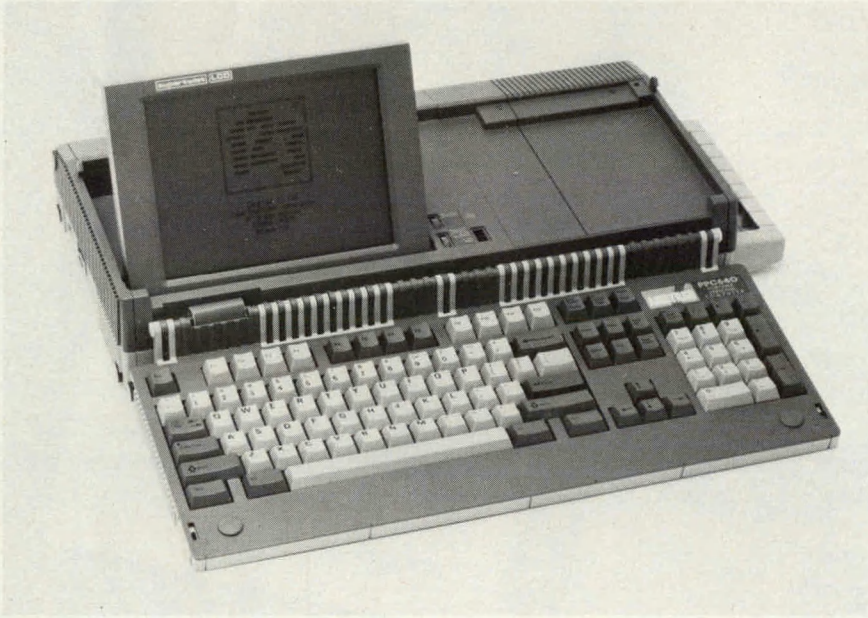
PC NEWS & NOTES

Performance Up, Prices Down: Report From Fall COMDEX



The large Amstrad PPC 640 laptop has a full-size enhanced AT keyboard and runs on ten C cells.

Each November, about 100,000 computer dealers, public relations people, and journalists fly into Las Vegas to gamble, hobnob at parties, exchange gossip, and—incidentally, it seems—tour the aisles at the Fall Computer Dealers Exposition (COMDEX). This year's show was dominated by PC-compatible laptop computers, 80386-based clones, falling prices, and freak rainstorms.

Even the sight of puddles in the desert couldn't draw attention away from the unrelenting deluge of PC compatibles, XT compatibles, AT compatibles, and 80386 compatibles. Most of the new hardware originates from the Orient, particularly Japan, South Korea, and Taiwan. But other nations are trying hard to crack the lucrative U.S. market, too.

For instance, Amstrad, a British manufacturer of PC clones, introduced two unique laptops—the PPC 512 and PPC 640. Unlike other laptop computers, the Amstrads have a full-length 101-key fold-down keyboard, a supertwist LCD screen that doesn't distort the aspect ratio, and three expansion slots. The PPC 512 has 512K of memory and a single 3½-inch microfloppy drive. The PPC 640 has 640K of memory, an internal 300/1200/2400 bits-per-second (bps) Hayes-compatible modem, and your choice of one or two 3½-inch drives. Although the Amstrads are largish, their prices are smallish: $799 to $1099.

In keeping with British eccentricity, however (Amstrad's desktop PC clones sport a few oddities, too), the new laptops lack one feature that's usually taken for granted: rechargable batteries. Instead of relying on nicads, the Amstrad laptops can be powered by ten C batteries, a car cigarette lighter, or standard AC current. The laptops are also distinctive in terms of appearance—best described as long and low, as required by their unusually wide keyboards.

Faster, Lower-Priced Desktops

On the desktop front, clones based on the 80286 and 80386 chips are continuing a trend toward faster and less expensive computing power.

Blue Chip, generally credited with opening up the under-$1000 market for complete PC-compatible systems, unleashed three new high-performance/low-cost AT clones. The best of the bunch may be the Blue Chip 286-12 MasterPC, which comes with a full megabyte of memory and zips along at 6, 10, or 12 megahertz. It also has a multifunction display card that's compatible with the IBM color/graphics adapter (CGA), enhanced graphics adapter (EGA), and video graphics array (VGA); a 1.2-megabyte floppy disk drive; eight expansion slots; built-in serial and parallel ports; a 101-key enhanced keyboard; and the MS-DOS 3.2 operating system—all for a grand total of $1699 suggested list price.

Even Atari is getting in on the

Arlan R. Levitan &
The Editors

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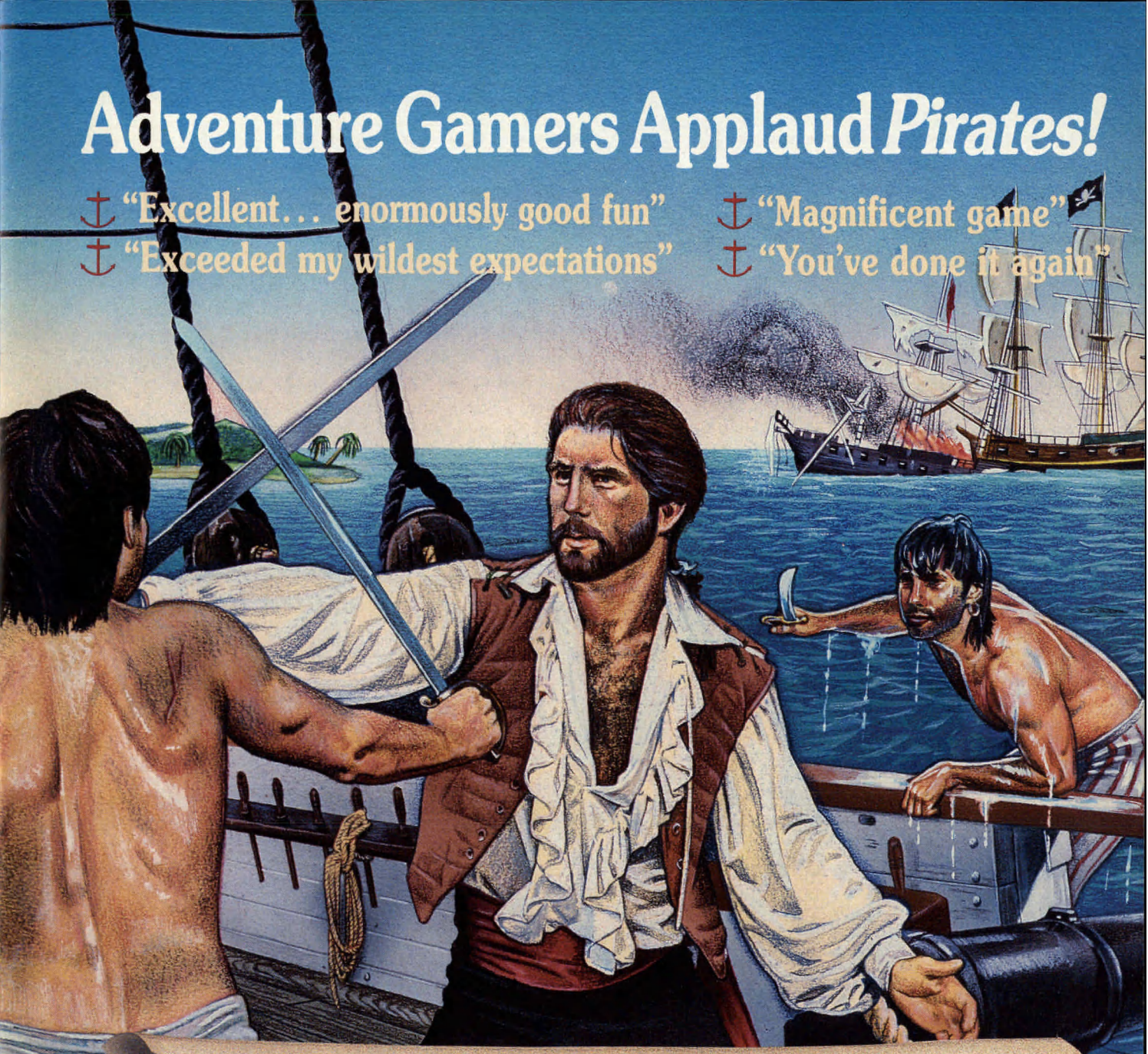

"**PIRATES!** *is excellent...a great swashbuckling game,* **enormously good fun**...*it should keep you playing for months.*"
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act. The Sunnyvale-based company announced three new PC-compatible systems to expand its existing line of two low-end PC clones (although the "existing line" still wasn't available in the U.S. at the time). The new PC4 is an AT compatible available in two configurations. Both have 640K of memory; four AT-style expansion slots; a mouse and mouse port; serial and parallel ports; a 5¼-inch or 3½-inch floppy disk drive; a hard disk controller; an amber-screen monitor capable of displaying EGA graphics in monochrome; and four built-in display adapters—CGA, EGA, monochrome (MDA), and Hercules.

The difference between the two versions of the Atari PC4 is speed. One model runs at 8 mHz with zero wait states, while the other runs at 12 mHz with one wait state or 8 mHz with zero wait states. According to Atari, the regular PC4 will be available early this year for around $2000; the faster version will be available at the same time for a bit more.

Atari also announced the PC5, an 80386 machine that runs at 16 mHz with zero wait states. It's scheduled to be available early this year for around $3000.

In all, COMPUTE!'s PC Magazine counted more than 50 companies offering 80386-based computers. With Taiwanese manufacturers now joining the fray, prices should be forced down still further.

The cost of upgrading an older computer to 80386 performance is plunging as well. Intel, having already slashed the price of its Inboard 386/AT accelerator card for AT-class machines ("PC News & Notes," January), has now introduced an 80386 card for PC and XT compatibles. At $995, the Intel Inboard 386/PC costs less than an AT clone and provides a tenfold boost in performance. The 386/PC card comes with a megabyte of memory that can be subdivided into directly addressable, extended, or expanded memory. An optional daughter card allows an additional two megabytes of memory to be added to the Inboard.

PS/2 Clones Coming Soon

Although no clones of IBM's PS/2-series computers were exhibited on the show floor, a raft of such machines are expected to surface at Spring COMDEX in May. Several manufacturers already are shipping chips that emulate the microchannel bus and graphics hardware of the PS/2s, and the other half of the clone equation is now in place, too.

At Fall COMDEX, Phoenix Technologies—the largest supplier of PC-compatible BIOS (Basic Input/Output System) chips—showed a series of PS/2-compatible BIOS components. To put compatibility doubts to rest, Phoenix engineers staged a dramatic demonstration of their chips. They popped the IBM BIOS chips out of IBM PS/2 Models 25, 30, 50, and 60, inserted their own chips, and ran the systems without a glitch.

Meanwhile, IBM was at COMDEX with a huge exhibit that trumpeted the release of OS/2, Standard Edition. To boost OS/2, IBM announced a special offer for PC-DOS owners. Until the $795 Extended Version of OS/2 ships in July, owners of IBM PC-DOS 3.0 or later may purchase the $325 Standard Edition for $200.

Despite the offer, there still seems to be resistance among PC-DOS users to convert to OS/2. This may have something to do with the additional financial commitment involved. OS/2 requires an 80286-based system with a minimum of two megabytes of memory, a hard disk, and a mouse. Another factor may be a new version of MS-DOS expected to appear late this spring: the multitasking, shell-based DOS 3.4.

Peripheral Prices Plunging

Once the exclusive province of well-heeled business users, dot-matrix printers with 24-pin printheads that produce extremely high quality text and graphics are now making their way into the home market. NEC's $495 P-2200 was the first 24-pin to break the under-$500 barrier, and it has been joined by Epson's new LQ-500. The LQ-500 retails for $499, is compatible with all LQ-series print drivers, and chugs along at 180 characters per second (cps) in draft mode, and 60 cps in letter-quality mode.

As expected, prices of 2400 bps modems are also taking a nose dive. Supra Corporation, a well-known supplier of hard disk drives and other accessories for Atari, Commodore, and Apple computers, is now shipping the SupraModem 2400 for $179. According to Supra President John Wiley, the SupraModem 2400 will also be available in packages that include all required cables and full-featured terminal software for $219.

Hard disk prices continue to fall as well, and a new technology developed by IBM may provide even more bytes per buck within a few years. IBM's Almaden Research Center in San Jose has announced a new recording technique that can squeeze more than a billion bytes of data onto a 3½-inch hard disk. The data is recorded on special molecularly plated disks in concentric circles, or tracks, that are less than a millionth of a meter wide. The maximum theoretical yield of the technique relies on thin-film read/write heads which are currently used only in expensive storage devices for mainframe computers.

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THE EAR

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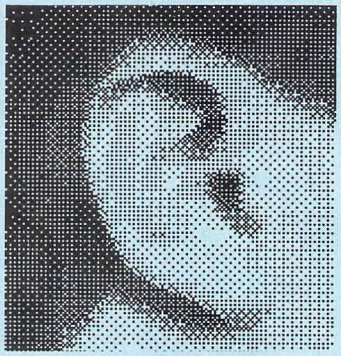

Dirty Harry Part 4

Ashton-Tate President Edward Esber stunned listeners at a recent conference of software developers by **threatening legal action** against those who want to make the *dBase* procedural language a standard for PC databases. Esber made it clear that any such attempt would invite swift retaliation from Ashton-Tate. **"Make my day,"** he challenged. While some software developers were put off by Esber's comments, others joked that they would support him in a bid for the mayor's office of Carmel, California.

Do You Feel Lucky?

At that same software developer's conference, Lotus Development hinted that Borland Software's new *Quattro* spreadsheet might be **cruisin' for a bruisin'** too. Rumor has it that Borland Founder/President Phillipe Kahn has bet a bundle that *Quattro* will be outselling *Lotus 1-2-3* by year end, and Kahn isn't taking any chances. Back in November, **hundreds of thousands** of registered users of previous Borland products received certificates allowing them to buy the $195 spreadsheet for only $75.

Trade Wars Cool Down

The U.S. has lifted some of its stiff tariffs on Japanese computers and microchips. Japanese-made computers that use Intel 8086 and 80286 chips, as well as their local variants (NEC's V30, V40, and V50), may now be imported without the **104 percent surcharges.** Most other 16- and 32-bit systems continue to be covered by the tariffs, which were imposed in the spring of 1987. Both NEC and Toshiba, which relocated some manufacturing to the U.S. to avoid the tariffs, say they won't remove the manufacturing to Japan now that the tariffs have been lifted.

PS/True Or False?

IBM proudly announced at Fall COMDEX that it had shipped **one million PS/2 systems** since the computers were introduced last spring. But some insiders take issue with IBM's statement, claiming that the volume has more to do with quotas imposed on dealers rather than with actual demand for the computers. At a COMDEX breakfast meeting, IBM Vice President William Lowe bewildered some industry watchers by apologizing to dealers for being "unable to meet all of your requirements" for PS/2 systems. Lowe said the PS/2 Models 25, 30, and 50 were in **short supply.** However, random checks at IBM dealers (during the holiday rush, no less) revealed that not only were all PS/2 models readily available, but many dealers also offered **unsolicited and substantial discounts** over the phone.

Up In Smoke

Pity the poor PR people: In addition to all of the usual travails associated with staging a media event at a major trade show, they also have to worry about the product itself throwing water on the fire. Take the case of **Datavue,** for instance. Among its new line of laptops unveiled at a press conference one morning at Fall COMDEX was an impressive-looking 80386-based computer. Unfortunately, the prototype machine apparently suffered some damage in transit and **went kablooey** during its coming-out party—in full view of reporters and other onlookers. Datavue's name for the new laptop? **Smoke.**

Next They'll Bake Them Into Cookies

The shortage of 80386 chips that pass all of Intel's 32-bit tests (see "The Ear," January) continues unabated. Soaring gray-market prices for 386 chips have been fueled by rumors that the shortage will **continue to worsen** as Intel ramps down production in preparation for a new version of the chip that will correct bugs found in earlier versions. However, Fall COMDEX did provide a possible answer to the question of where all those defective 386 chips are going. One of the show's most popular freebies could be found in goldfish bowls at the Intel booth: genuine 80386 chips imbedded in **lucite key-chain fobs.**

The Genesis Of A Name

Speaking of semiclever product names, did you hear what Atari has dubbed its new local area network (LAN)? **Moses PromiseLAN.** Seriously. Given Atari's tendency to announce products far in advance of actual delivery (such as the 1200-bps modem announced two years ago, and the under-$500 hard disk drive announced nearly three years ago, neither of which are yet available), some folks are wondering if Moses PromiseLAN will wander in the **desert of vaporware** for the next 40 years.

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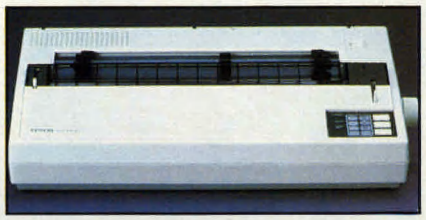

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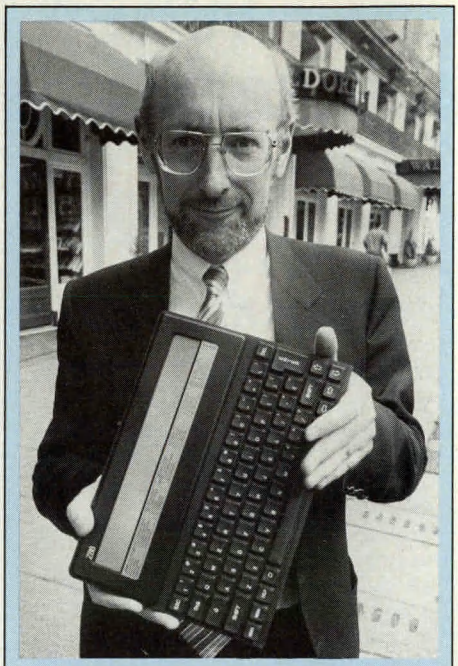


By far the most unusual laptop at Fall COMDEX was the Sinclair Z88, shown here with its inventor, Sir Clive Sinclair. The British computer has an eight-bit Z80 microprocessor, a new operating system called OZ, and can address up to four megabytes of memory with 20K available to the user.

Off The Beaten Track

Even staid shows like COMDEX have their share of unusual products. National Data Computer demonstrated its Datacomputer 3.0, a 36-ounce **handheld PC compatible** with an LCD screen that displays eight lines of 26 characters. The keyboard is so small it would give a Lilliputian fits.

At the other end of the scale was NEC's APC IV Powermate Portable, an elephantine AT compatible that's inexplicably about **twice the size and weight** of the company's excellent MultiSpeed laptop.

The Harold Stassen Memorial Award must go to Sir Clive Sinclair, who's topped a string of **Z80-based computers** (remember ZX-81 and Spectrum?) with his $499 Model Z88 laptop. The British-made Z88 was shown by England's Cambridge Computers in hopes of luring U.S. distributors. Unfortunately, most of those who passed by concluded that the Z88 is even less compatible than **Prince Charles and Lady Di.** **PC**

Do you have a question or a problem about hardware or software? Or have you discovered something that could help other PC users? If so, we want to hear from you. Write to PC Feedback, COMPUTE!'s PC Magazine, P.O. Box 5406, Greensboro, NC 27403. We regret that we cannot provide personal replies to technical questions.

Editor's Note: Unsigned letters in this column are compilations from reader inquiries.

Memory-Hesitant Programs

In "Getting Down to Business" [November 1987], there was mention of a program that can remove memory-resident utilities without resetting the computer. Can this be done with the "Screen Saver" program from that issue? I like this utility, but it locks up Aldus's *PageMaker*. The screen goes blank, and I can't get it back up with keystrokes or mouse movements. Since *PageMaker* uses a white palette, Screen Saver would be particularly useful here.

Does this have something to do with the mouse/keyboard interaction? Could I have inserted SAVESCRN.COM in the wrong line of AUTOEXEC.BAT? Will I have to reset whenever I go into *PageMaker*?

David Hicks

As the "Screen Saver" article mentions, DOS was not designed with memory-resident programs in mind. These pop-up programs rely on programming tricks to install themselves in memory and respond to a "hot key." Often there are conflicts between memory-resident utilities and application programs, or between two or more memory-resident utilities that are installed simultaneously. That's why we always recommend testing a new memory-resident utility on your system before doing any important work—whether the utility is one published in COMPUTE!'s PC Magazine or purchased commercially.

The only way to find out for sure if a memory-management program like the one mentioned in "Getting Down to Business" will work with Screen Saver is to try it and see. There are several such programs available, and they aren't completely foolproof.

It's possible that changing Screen Saver's location in your AUTOEXEC.BAT file might have some effect on its interaction with PageMaker *if you're also installing other memory-resident utilities. Some pop-ups are sensitive to the point at which they're installed in memory. For instance, some of them insist on being the last one in the chain—a real problem when you're trying to install two or more such programs. Because their behavior is so unpredictable, the only way to find out for sure what works is to experiment.*

Personal Calendar Correction

Editor's Note: There's a small problem with "Personal Calendar" (November 1987): Pressing the zero key to select the month of October will crash the program. Fortunately, there's a simple solution: Select October from the menu using the cursor keys instead. Everything else functions correctly.

If you have a copy of *Turbo Pascal*, you can fix the program itself. The problem is in a procedure called select_month. Change the procedure to look like this and recompile:

```
procedure select_month;
    .
    .
    .
else begin
  case a of
      #45: begin
        .
        .
        .
        end;
      #61: begin
        .
        .
        .
        end;
      #48: begin
        sel_flag := true;
        cur_month := 10;
        end;
      else if (a>#48) and (a<#58) then
  .
  .
  .
```

Sorting A Directory

I have a lot of files on my hard drive. Is there any way to sort the directory alphabetically so it's easier to find files?

*There are utility programs—*Norton Utilities, *for example—which sort the directory on the disk itself, but you can also use DOS to sort a directory listing. Here's how.*

First, put the DOS SORT program (you'll find it on your DOS master disk) in the current drive or directory. Then enter the following command at the DOS prompt:

DIR | SORT

If you want a printed listing of the sorted directory, enter

DIR | SORT > LPT1:

If you want a disk file which contains the sorted listing, enter

DIR | SORT > *filename.ext*

where filename.ext *is the name of the file in which you want to store the sorted listing.*

Unlike utility programs which sort the directory on the disk, DOS doesn't actually make any changes to the disk—it merely sorts the directory listing. The directory itself remains unsorted. If you enter DIR, you'll see the directory in its original order.

The commands above illustrate the use of some special DOS symbols, the filter symbol (|) and the redirection symbol (>). The filter symbol is a shifted backslash on most keyboards. These symbols allow you to control the way output is routed to the different devices which make up your computer system.

A computer is actually a collection of devices that accept input and produce output. Devices include the keyboard-monitor combination (known to DOS as the CON, for CONsole device); disk drives; and perhaps a printer or modem. Printers are addressed by the DOS device names PRN, LPT1, LPT2, or LPT3. Modems are usually addressed as AUX, COM1, or COM2.

The DOS redirection and filter symbols allow you to reroute the information that flows from one of these devices to another. This is called piping.

In the last two examples, the output of the DIR command is piped away from the standard output device, the console screen. Instead, the output is filtered through the SORT command and then piped to the printer or a disk file. Here's another example:

MORE < *textfile*

MORE is another program found on your DOS disk. It displays one screen of a text file. Then it displays a message and waits for a keypress before displaying the next screen. This makes text files easier to read than if you used the TYPE command. If you enter

DIR | MORE

the directory listing is piped through the MORE filter and is displayed one screen at a time. If you enter

DIR | SORT | MORE

the directory listing is first sorted and then is displayed one screen at a time. Here's still another example:

TYPE *textfile* > LPT1:

This pipes the output of the TYPE command away from the screen to the printer, producing a hardcopy of any text file. For more details on DOS filters and redirection, see your DOS manual.

DIP Tip

I used the print-screen function to print calendars from the "Personal Calendar" program in the November 1987 issue of COMPUTE!'s PC Magazine. I enclose two of them. Sometimes, the lines making up the calendar are as they appear on the screen. Other times, they're garbled. I've fiddled with the DOS GRAPHICS and GRAPHTABL commands with no success. Do you have any ideas?

A. C. Wright

You don't need to use DOS to get the right printout. You do need to adjust your printer. To do this, you'll probably have to change some of the printer's DIP (Dual-Inline-Package) switches. Otherwise, the printer translates the computer's output into the wrong kinds of characters. See Figure 1 for an example.

For compatibility with the widest possible range of computers, most printers are designed to print more than one character set. These days, almost all printers have an IBM mode which is selected by flipping the DIP switches. Consult your printer manual to find out the proper switch positions for IBM mode on your printer.

Drive At Work

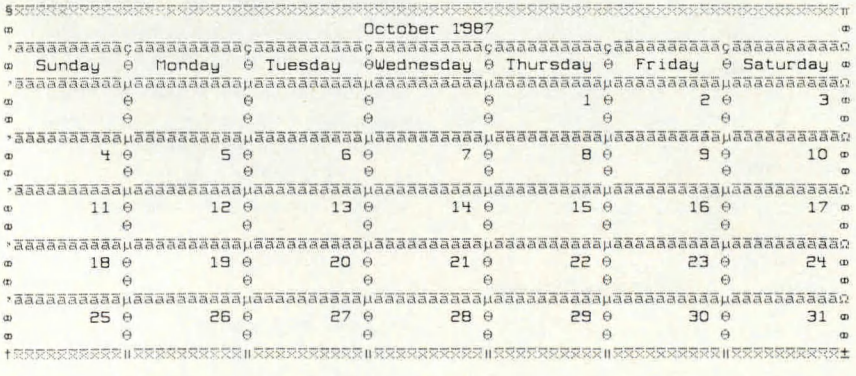
The *FastCopy* program in the November 1987 issue doesn't seem to work properly when copying with a one-drive system (drive A to drive A). Immediately after copying from the source disk to memory, a message on the screen prompts you to insert another disk into drive A. The problem is that the drive doesn't stop running so you can do this. What's wrong?

Adolph P. Canales

Nothing. While it's generally not a good idea to open a drive door when the busy light is on, you can make an exception with FastCopy. FastCopy *waits for you to close the drive door before it begins to copy to the disk in drive A. When the drive door is open, the drive heads are raised from the surface of the disk. Even if the busy light is on and the drive motor is running, no harm will come to your disk or your drive.* FastCopy *takes this approach to speed up copying, since the drive doesn't have to stop and restart for each disk swap.*

With any other program, you shouldn't open a drive door when the busy light is on and the drive is running, because the computer may be writing to the disk. Interrupting this process could ruin a file or even corrupt the entire disk.

Figure 1: An example of a "Personal Calendar" page made with wrong switch settings on the printer.



COMMAND.COM, I Presume?

I have a hard drive, and usually I boot the computer from it. Sometimes, however, I boot the computer from a floppy disk in drive A because I want to configure the computer in a special way for a particular task. If I do this, DOS sometimes tells me to *Insert COMMAND .COM disk in drive A:*, and this can be a nuisance. Why doesn't it use the copy of COMMAND.COM which exists on the hard drive?

DOS always looks for COMMAND.COM on the drive from which the computer was booted. If you boot the computer from drive A, DOS looks for COMMAND.COM on drive A, even if COMMAND.COM exists in some other drive or directory.

COMMAND.COM is a part of DOS which performs many tasks. It reads and executes the commands you enter at the DOS command line, executes batch files, and loads programs. This part of COMMAND.COM is loaded from the boot disk into the computer's memory. When a large program needs that part of memory, DOS allows the program to overwrite COMMAND.COM. When you exit the program, DOS checks to see if all of COMMAND.COM is still in memory. If it isn't, DOS must reload it from disk. That's why DOS sometimes prompts you to insert a disk with COMMAND.COM.

For the sake of convenience, you can instruct DOS to look elsewhere for COMMAND.COM. If you enter the command

SET COMSPEC=C:\COMMAND.COM

DOS looks for COMMAND.COM in the root directory of drive C (your hard drive).

If you want to see where DOS looks for COMMAND.COM, enter SET by itself on the command line. DOS responds with

COMSPEC=*path*\COMMAND.COM

where path *is the name of the path where DOS looks for COMMAND.COM.*

A good place to put the SET COMSPEC command is in an AUTOEXEC.BAT file on your boot disk. That way, DOS won't bother you when it needs to load COMMAND.COM.

Strange Characters

I found a hitch in the program "Front & Back Hardcopy" in the November 1987 issue of COMPUTE!'s PC Magazine. It doesn't draw the boxes properly, and there's a lot of garbage on the screen. What's wrong?

Dorothy Riley

Several readers reported this problem, but it's not the program's fault. What you're seeing are characters known as ANSI escape sequences. *Briefly, these are commands sent to an output device (in this case, the screen) to alter its behavior in some way. You can identify ANSI escape sequences because each one begins with a left arrow followed by a left bracket and a few more characters. This pattern often repeats. See Figure 2 for an example.*

Whenever you see this pattern, it means a program is using something called the ANSI.SYS device driver *to perform some function. ANSI.SYS is a program that allows DOS to interpret the ANSI escape sequences properly. In the case of "Front & Back Hardcopy," ANSI.SYS controls the cursor as it draws the boxes which make up the menu.*

To make the ANSI sequences invisible, you must install the ANSI.SYS device driver on your system. This requires a text file named CONFIG.SYS with the following line:

DEVICE = ANSI.SYS

Save this file on your boot disk—the floppy disk you insert in drive A when switching on your computer. If you have a hard drive system, save it on the root directory of the hard disk.

Figure 2: Untranslated ANSI escape sequences appear like this on the screen.

```
                                                              tcats
=2h0;37;40m2J6;12H┌──────────────────────────────────────────┐┌──────┐
┌─
7;12H│ File:_____                                │ 7mFRONT  PAGES0m|
8;12H│                                           │  BACK PAGES  │
9;12H│ Header:_____                              │  ALL  PAGES  │
10;12H└───────────────────────────────────────────┘└──────────────┘
11;12H┌──────────────────────────────────────────┐
12;12H│ Start Header Page Numbering At:1____     │┌──────────────┐
13;12H├──────────────────────┬───────────────────┤│ 7m CONTINUOUS 0m|
14;12H│ Lines Per Page:66_   │ Left Margin:0_    ││  PAGE  WAIT  │
15;12H├──────────────────────┼───────────────────┤└──────────────┘
16;12H│ Starting Pg:1____    │ Top Margin:0_     │
17;12H├──────────────────────┼───────────────────┤┌──────────────┐
18;12H│ Ending Page:32767    │ Bottom Margin:0_  ││ 7m   PRINT   0m|
7;19H └──────────────────────┴───────────────────┘│    EXIT      │
                                                 └──────────────┘
```

You must also save the ANSI.SYS program itself on the root directory of your boot disk or hard disk. (ANSI.SYS can be found on the DOS master disk that came with your computer.) Then, to install ANSI.SYS, reboot the computer.

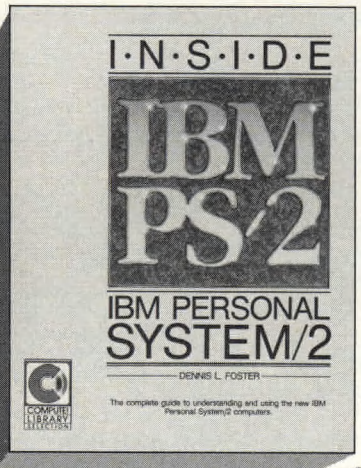
For more information about ANSI.SYS and CONFIG.SYS, see your DOS manual.

Graphics And Monochrome Monitors

Some of your programs won't run on my PC compatible with a monochrome monitor. In particular, your game programs nearly always require a color/graphics adapter, according to the articles. I get an error message when I try to run them on my system. I wouldn't mind if they were in black-and-white; why can't you make them work on monochrome systems?

Trying to run color graphics programs on a PC compatible with a monochrome display adapter (MDA) is like trying to run Commodore programs on an IBM—it sounds like a great idea, but it just won't work. The explanation is the same in both cases: The necessary hardware simply isn't there. Graphics programs require a video display adapter capable of displaying graphics—such as IBM's color/graphics adapter (CGA) or its equivalent. The MDA board can't display graphics.

Some monochrome systems—particu-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larly laptops—contain the equivalent of a built-in CGA, and they can run CGA programs in black-and-white. Some other monochrome systems have video adapters that are known as Hercules-compatible, *and these systems can also display certain graphics in black-and-white. Even with a Hercules adapter, however, a special emulator program is required to run CGA software. We're planning to publish such a program in the near future, but these programs are not 100-percent reliable.*

Aside from these exceptions, PC compatibles with MDA just aren't designed to handle graphics. They are intended for text-based applications only. Certain monochrome programs (such as TheDraw, *the featured program in this issue's "Best of the Boards" column) simulate graphics with special graphics characters, but it's not the same as true bitmapped graphics.*

Of course, any monochrome system can be upgraded for graphics applications by installing a graphics adapter. The most popular graphics adapter by far is CGA. That's why nearly all of the games published in COMPUTE!'s PC Magazine, as well as those published by commercial software developers, are written for CGA. Games are rarely written for monochrome systems because the assumption is that monochrome users aren't interested in games—if they were, they would have a computer with CGA.

For more information about display boards for PC compatibles, see "Choosing a Display Standard" in the September 1987 issue.

Assigning Drives

I have just installed a hard drive. I have a word processor that always looks for a configuration file on drive A, but I now want to keep the file on hard drive C. It's a nuisance to keep a floppy with the configuration file in drive A. Is there some way to change the word processor so that it looks for the file on drive C instead of A?

You don't have to change the word processor; you can use the DOS ASSIGN command to change the drive letters instead. For example, to make drive C respond to calls to drive A, enter

ASSIGN A=C

When your word processor makes any calls to drive A, DOS reroutes them to drive C. As a test, enter

DIR A:

You should see the directory for drive C instead of drive A.

Note that the reassignment remains in effect even after you've quit your word processor. To return all drive assignments to normal, enter

ASSIGN

In effect, drive A itself no longer exists when you reassign the drive letter. To avoid difficulties arising from the reassignment, you can put the assignment statements into a batch file which also calls the word processor. For example, here's WP.BAT:

```
ASSIGN A=C
WORDPROG
ASSIGN
```

where WORDPROG *is the name of your word processing program. This batch file reassigns drive A to drive C, then runs the word processor. When you exit the word processor, it restores drive A.*

Note that ASSIGN is a program on your DOS master disk. To use it, you must copy ASSIGN.COM to the current drive or directory or set up a PATH to its current location.

Back To BASICs

You publish BASIC programs in nearly every issue. How do I know which programs are written in BASIC, and how do I run them?

The magazine articles always give instructions on how to run the programs. In the case of BASIC programs, the instructions are almost always the same: Load BASIC first, then load and run the program.

By convention, BASIC programs usually have the extension .BAS in their filenames (such as PROGRAM.BAS). Whenever you see this extension in a filename, you can safely assume the program is written in BASIC and requires you to load BASIC before running the program.

There are two ways to do this. Start by locating the disk which contains BASIC. Usually BASIC is included on the DOS master disk, but it comes on a separate disk with some computers. It usually consists of one or more files which contain the word BASIC. *All of these files are part of the BASIC interpreter. Copy them to a work disk and set the master disk aside for safekeeping. Most people with hard drives make a new subdirectory called \BASIC, and they copy BASIC into that directory.*

To run BASIC, make sure you're in the directory to which you've just copied the BASIC files. Then, at the DOS prompt, enter

BASICA

This loads and runs the BASIC interpreter. (BASICA stands for Advanced BASIC.)

To load and run a BASIC program, enter

RUN "*PROGRAM***"**

where PROGRAM *is the filename of the BASIC program you want to run. If the program is on a different drive or in a different directory, you'll have to specify a pathname, of course (such as RUN "B:PROGRAM"). Note that you don't have to enter the filename extension if it's .BAS.*

The second way to run a BASIC program is to combine the two steps described above. At the DOS prompt, enter

BASICA ***PROGRAM***

where PROGRAM *is the filename of the BASIC program you want to run. Again, you don't have to enter the filename extension if it's .BAS. If the program is on another disk or in another directory, you'll have to specify the pathname (such as BASICA B:PROGRAM).*

Some BASIC programs need to load data files from disk. For example, a database program may load a file of names and addresses. If the program doesn't prompt you for the drive where the data files are located, it probably looks for them on the current drive or directory. If the data files aren't there, BASIC issues a File Not Found *error message. If this happens, consult the program instructions for information about where the files should be located.*

When you exit some BASIC programs, they send you back to DOS. If they don't, you can return to DOS by entering the SYSTEM command. **PC**

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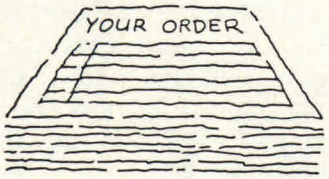

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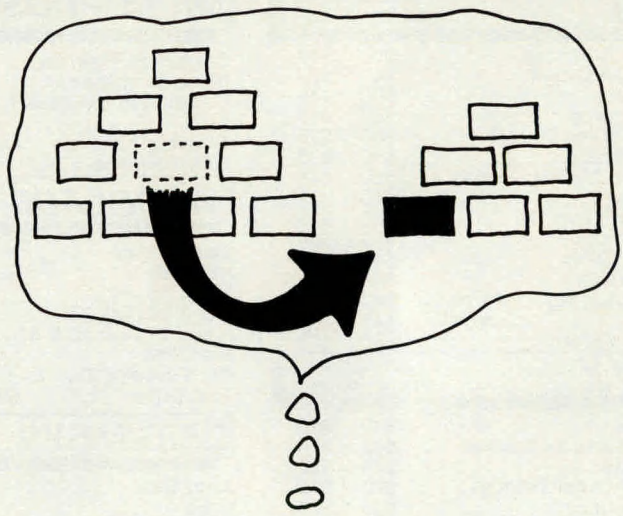

The End Of Word Processing

Less than ten years after secretaries, executives, professionals, and many other white collar workers first began to explore and exploit the advantages of electronic word processing, that technology may already be outmoded.

The new type of software that thousands of people have discovered is the *automated idea processor.* Available from several vendors in such products as *PC Outline, Think Tank, Max Think,* and *Thor* (Thought Organizer), idea processors provide nearly the same features as word processors—but much more. They go beyond word processing to offer sophisticated tools for managing and manipulating groups of ideas within your text.

Whether you write memos, manuscripts, reports, proposals, business plans, letters, or other documents, the power of an automated idea processor will help you do better work more easily and in less time. An idea processor is about as big an improvement over word processing as the word processor was over pencil and paper.

To understand and appreciate the improvement, think about what a word processor does. It simplifies the rapid entry, capture, and storage of text; the unlimited modification of this text; and the ability to print the text on paper.

Robert A. Moskowitz

Although lightning fast and extremely productive, word processing (and even electronic publishing) offers little more than an enhanced version of traditional mechanical typewriting. Word processing is faster and easier than paper and ink, but essentially it's the same medium. You still enter material, rewrite it, and rearrange it using time-honored mental processes.

Idea processing, however, applies the power of the computer to managing and manipulating ideas. You can rapidly compare and contrast, sort and organize, and hide and reveal supporting detail. This creates a climate for faster, more powerful mental processes unmatched by simple, mechanical typing or word processing.

Computerized Thinking

Some fortunate people have no trouble generating or discovering more miraculous ideas than they know what to do with. But the rest of us can benefit from a thought processor that helps every seed of an idea germinate, grow, and flower.

Most word processors let you work on one (or possibly a few) files which are basically continuous streams of text. You must manipulate these files one piece at a time. Idea processors, however, let you create and manipulate as many as nine files at a time. In addition, each file is constructed of many independent elements. You can easily and quickly rearrange the elements and the files in many combinations of groups, layers, and sets.

Idea processing incorporates, but goes well beyond, mechanical typing and editing processes. It lets you shuffle, organize, and pyramid the elements of a document in various combinations, then rearrange them as rapidly as you change your mind.

An idea processor lets you designate a word, phrase, sentence, paragraph, or chapter as a unit, and it lets you group these units in various combinations, layers, and sets with others. One common grouping strategy is the conventional outline format you learned in grade school. But various products lend computer power to many other horizontal, vertical, and multidimensional groupings.

The result is that you can shift your attention from the words themselves and think more clearly and directly about the underlying ideas. With computer power supporting your thought processes, thinking becomes more efficient than ever before.

How They Work

To get started with an idea processor, you must manually divide your text into units for the computer to manipulate. But once you do, you have a new ally. A certain degree of machine intelligence can suddenly

help you reorganize your thoughts in many different, and often extremely fertile, arrangements.

Let's take a sentence as simple as *The quick brown fox jumps over the lazy dog.* Using a word processor, with a few keystrokes you can change *quick* to *fast, brown* to *gray, fox* to *rabbit,* and *dog* to *turtle.* Sure, that's a powerful feature.

But with the same few keystrokes, an idea processor can sort the ideas in that sentence. You can make each word a keyword or title, and write a whole chapter of supportive and expanded material behind each one of them. With a few keystrokes, you can then display only the original sentence, the full text of your new material, or some combination.

Another exciting feature is *cloning.* Like a spreadsheet that places a single value or formula in many different cells, idea processors let you place a single thought or unit of text into many different locations within a document or series of documents. Like a spreadsheet, when you change the text in one of these locations, the computer automatically replicates the change everywhere else.

Idea processing also allows you to collect any combination of ideas from any of your files and bring them together with just a few keystrokes. Word processing helps you manipulate one word or block at a time, but an idea processor helps you work directly with one, some, or all of the independent units you have established.

Generally, these and other capabilities let you manage the ideas and main points in your files much more easily and visually than with any other tool.

Manipulating Ideas

The key advantage of idea processing is that ideas can more easily grow, merge, and develop into much greater concepts than ideas you've merely jotted down. Just as a word processor smooths and speeds the effort of mechanically recording and manipulating your words, a thought processor smooths and speeds the effort of recording, manipulating, and reflecting on your thoughts.

Ten ideas and a word processor may yield a great document. But the same thoughts manipulated with an idea processor may metamorphose (in your brain, not the computer) into a truly new concept or a brilliant program of action. Word processing cannot do nearly as much to spark this type of creative thinking.

In fact, the new software automatically supports some of the most important creative thinking exercises ever developed. For example, an idea processor makes it easy to combine many separate ideas or to separate single ideas into parts. The idea processor also simplifies and can help generate unusual juxtapositions of ideas, as well as endless lists of variations, opportunities, and possibilities—all well-established processes for creative thinking.

Although essentially mechanical processes, these manipulations often lead to the development of new and important ideas. In a real sense, an idea processor adds electronic horsepower to the work of cultivating and nurturing raw ideas until they burst into full bloom.

Better Idea Processing

Although the extra features of an automated idea processor may seem hard to grasp, these programs are very practical tools. Here are some tips on how to use one.

- Make every idea, and in some cases parts of every idea, a separate unit. It takes only one keystroke, and from then on the computer recognizes these phrases, sentences, and paragraphs for manipulation in many different ways. The more you subdivide your ideas, the more leverage you obtain for processing them electronically.
- Try organizing your ideas many different ways. Use the idea processor to sort, shuffle, collect, modify, combine, fragment, and otherwise manipulate your ideas. Many times an idea that looks dumb in one context turns out to have real value when seen from another perspective. You'll quickly learn to generate more ideas with the idea processor and to find the best ones in any piece of work.
- Make frequent use of the idea processor's expand/collapse capability. It helps you achieve a clear structure as you develop your memo, report, business plan, or proposal.

An Idea Whose Time Has Come

Although it's a relatively new concept, electronic thought processing is here to stay. If you want to think better, you ought to try it.

I deliberately avoided a discussion of specific programs because most good thinking is too personal and quirky for me to recommend which software will aid you the best. I suggest you play with some idea processors for a few days until you find one that helps you with your own style of thinking.

At first, idea processing may seem bothersome. I remember that word processing seemed very difficult at first when compared to my IBM Selectric typewriter. But I'm betting that after you learn the basic controls, you'll sense the power of these tools. Once you do, you'll easily judge for yourself which program best suits your preferences and thought processing requirements.

Robert Moskowitz is a business consultant based in Woodland Hills, California. Address mail c/o COMPUTE!'s PC Magazine, P.O. Box 5406, Greensboro, NC 27403. **PC**

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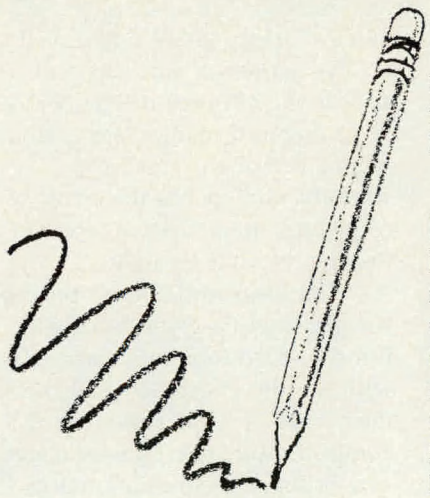

TheDraw

"Best of the Boards" features outstanding programs gathered from bulletin board systems throughout the country. Some of the programs are in the public domain; some are copyrighted "shareware" programs (freely distributed in return for voluntary donations). In each case, COMPUTE!'s PC Magazine obtains the latest version of the program directly from the original author in return for a publication fee. We then test the program, rework the documentation, and present the polished packaged here.

This issue's featured program is The-Draw *by Ian Davis. It's a clever, unusual program that allows you to design static or animated screen displays that will work on nearly any PC-compatible computer. You can design "slide show" screens for group presentations, demo screens for sales displays, and title screens for programs written in a variety of programming languages. Because the screens are composed of standard IBM PC characters, they work on any IBM PC, PCjr, XT, AT, or compatible with at least 256K of memory and either a monochrome or color monitor.*

Designing screen displays on your computer can be difficult, at best. Using your word processor to design a screen for a program or a presentation is a time-consuming project. In addition, typing special graphics characters on your screen is difficult, if not impossible, with most word processors.

This issue's featured shareware program, *TheDraw*, allows you to use all of the characters available on your PC in any screen display—including the extended ASCII (graphics) characters. *TheDraw* uses the DOS program ANSI.SYS to give you complete control over your monitor. Acting as a control program for ANSI.SYS, *TheDraw* gives you an easy-to-use system for drawing screens, no matter what monitor or display adapter you have. You can use the program's features to control screen colors on color monitors, and even create images out of graphics characters on monochrome monitors.

In addition to this, *TheDraw* allows you to create animated displays. Screens created with *TheDraw* can be displayed later with the TYPE command, even without *TheDraw* program itself. Graphics images, animation sequences, and other attractive features included in your screens will be recreated exactly as you planned them, as if by magic.

Finally, if you're a programmer, you'll like another aspect of *TheDraw*: It can save screens in several programming formats. This allows you to incorporate your screen designs into programs written in BASIC, machine language, Pascal, or C.

Program By Ian Davis
Column By
George Campbell

Installing *TheDraw*

Before using *TheDraw*, you need to install it on a floppy disk or hard disk drive. You also need to install the DOS program ANSI.SYS as a device on your system within a CONFIG.SYS file. To install *TheDraw* on a floppy drive system, follow these steps:

1. Format a blank floppy disk with the /S switch to write DOS files on the disk. Example: FORMAT B:/S
2. Once the disk is formatted, copy the following files from the magazine disk onto the working disk: THEDRAW.COM, CASTLE .ANS, and CONFIG.SYS.
3. Copy the file ANSI.SYS from the DOS disk that came with your computer to your working disk. Your working copy of *TheDraw* is now ready for use.

To install *TheDraw* on a hard disk system, follow these steps:

1. Make a new directory on the hard disk with the command MD \THEDRAW.
2. Copy THEDRAW.COM and CASTLE.ANS from the magazine disk into this directory.
3. Before you can use *TheDraw*, you must install ANSI.SYS as a device in your CONFIG.SYS file. Use the DIR command to check for a file called CONFIG.SYS in the root directory of your hard disk. If there is no CONFIG.SYS file, copy CONFIG.SYS from the magazine disk into the root directory. If you already have a CONFIG.SYS file, add the following line to the file:

```
DEVICE = ANSI.SYS
```

You can do this with any text editor that can save files in ASCII format. Simply load

CONFIG.SYS into the editor and add the above line to the file.

4. Finally, copy ANSI.SYS into your root directory. The combination of the line DEVICE = ANSI.SYS and the ANSI.SYS program installs ANSI.SYS as a device driver. It will be transparent to any other programs you use, but it is necessary for *TheDraw*.

Running The Demo

Before discussing how to use the program, let's take a quick look at what it can do. An animated demo created with *TheDraw* is included on this issue's magazine disk. It looks best on a color monitor, but should work with virtually any PC-compatible computer, even those with monochrome monitors.

To run the demo, reboot your computer with the new working disk you've created in drive A, unless you've installed *TheDraw* on a hard disk. In the latter case, reboot the computer normally. (The reason for this step is that the DOS program ANSI.SYS must be installed as a device on your system in a CONFIG.SYS file. If you followed the instructions above, this will happen automatically when you reboot the computer.)

When the DOS prompt appears, enter the command TYPE CASTLE.ANS. The demo—a short animated cartoon involving a knight and castle—appears on your screen. If you have a color monitor, the castle appears in rich hues of blue; if you have a monochrome monitor, the castle is constructed of special graphics characters. Notice that the demo runs by itself, without loading *TheDraw*.

You can replay the demo as often as you like by entering TYPE CASTLE.ANS when the DOS prompt reappears.

Note: If you have an AT-class computer or a "turbo" PC or XT, the animated demo may run too fast to see. Later in this article, we'll show how you can control the speed of any animated screens.

Running *TheDraw*

Now let's see how the program works, so you can design your own screens and animated demonstrations. Start the program by typing the following command at the DOS prompt:

```
THEDRAW
```

You'll see an opening screen that displays the program title and the author's request for a registration fee. Press any key to move to the editing screen.

The screen is blank, except for a status line at the bottom. The first entry in the status line displays the current cursor location. Next, the word *Color* is displayed in the current drawing color (if you have a color monitor).

The next entry indicates whether the program is in Text or Draw mode. To the right of the status line is a menu of function keys that displays extended ASCII graphics characters. Finally, just above the menu is a line showing the number of keystrokes you've entered and the number still available. *TheDraw* can store up to 5000 keystrokes. Additional information appears on the status line when you use various features of the program.

To see a pair of help screens that list a summary of the *TheDraw*'s commands, you can press Alt-H at any point in the program.

Entering Characters In Normal Mode

TheDraw always starts in the normal, nonanimated mode. In this mode, you can create simple, static screens for presentations, title screens, or any other purpose.

To begin designing a screen, simply enter characters, much as you would with a word processor. As usual, the cursor keys control the location of the cursor on the screen. In addition, you can use the following keys to move the cursor:

Home	First column of current line
End	Last column of current line
PgUp	First line of current column
PgDn	Last line of current column
Ctrl-Home	First character of current line
Ctrl-End	Last character of current line
Ctrl-PgUp	Upper left corner of screen
Ctrl-PgDn	Lower left corner of screen
Tab	Next tab position
Shift-Tab	Previous tab position
Enter	First column of next line

Pressing one of the function keys places the corresponding graphics character from the status-line menu at the cursor position. To change the character menu, hold down the Alt key while pressing one of the function keys. The menu on the status line displays a new set of available characters. The ten character sets include the extended ASCII characters needed to create boxes and block graphics, as well as other special characters.

Choosing Screen Colors

So far, we've looked only at the simplest method of entering characters on the screen. *TheDraw* offers much more. Additional features of the program are called with Alt-key combinations. At any time after entering a command, you can abort the command with the Esc key.

The **Alt-A** key combination allows you to select colors for the screen if you have a color monitor. You can actually change the color of each character if you choose, creating a multicolored display. When you choose this command, a screen appears to show you the color choices available.

To select a color, type the number of your choice. Select the foreground color, then press Enter. Select a background color and press Enter again, returning to the editing screen. On monochrome screens,

your choices are limited, but, in all cases, the colors shown represent the colors or screen attributes that can be used with your monitor.

The foreground and background colors you select remain in effect until you change them. You can change colors as often as you wish. The status line's Color indicator always matches the current drawing color.

There's also a shortcut for changing the background color: Press Ctrl-Right or Ctrl-Left to step through the color palette.

Block Operations

The **Alt-B** key combination allows you to perform operations on entire block-shaped areas of the screen. After you press Alt-B, the program prompts you to locate the upper left corner of your imaginary block. Move the cursor to the desired location, and then press the space bar. Now, move the cursor to the lower right corner of your block. Characters within the block you define are highlighted. Notice that you can define a single line or column as a block.

When you press the space bar again, a menu offers you several choices. To select a choice, type the first or highlighted character of your selection.

The first choice, Copy, allows you to move and copy your block to a new screen location. Move the block with the cursor keys. You can Stamp the block in the new position by pressing S. This operation can be repeated as often as you want. Pressing E transfers the block to a second screen; the use of alternate screens is explained below. Pressing U for Under stamps the block on the screen, but does not interfere with other characters at the new block location. This feature allows you to move a block of characters to a new location without disturbing other characters.

When you're finished, press Enter to save your changes and leave this menu. Pressing Esc leaves the Copy menu without making any changes.

Moving And Filling Blocks

Back to the original Alt-B menu. The second choice, Move, allows you to move the block to a new location. The same set of commands found in Copy mode is active here, but the Move command erases the block from its previous location after moving it.

The Fill command allows you to fill any area you define, in several ways. Pressing F for Fill displays a submenu. Your choices are

(A)ttribute. Pressing A changes the block's colors to the current set, as selected from the Alt-A menu. You must make your color choice before selecting the Alt-B command.

(F)oreground. This menu choice changes the block to the current foreground color.

Bac(K). Selecting this command changes to the current background color.

(U)se. This choice changes both colors to the ones in effect when you first pressed the Alt-B combination.

(C)haracter. Pressing C at this menu allows you to fill the entire block with a specific character. The program prompts you for the character. Type a character to fill the block. Type a space to clear the block.

(B)oth. This choice combines the Attribute and Character selections, changing colors and filling the block with your choice of characters.

Text Functions

Returning to the main Alt-B menu, selecting (T)ext gives you another set of choices:

(B)ox. This selection draws a box around your chosen block. It uses the box-drawing characters shown in the current function key menu.

(O)utline. This choice performs the same function, but looks at the screen and expands the box to include any text not fully contained in the block.

(C)enter. Centers the text within the block.

(L)eft. Left-justifies within the block. In other words, the text is aligned with the left border.

(R)ight. Right-justifies inside the block. In other words, the text is aligned with the right border.

Other Block Commands

After defining a block, you may use several other commands to act on it.

(D)elete. This removes the block from the screen, shifting other characters to the left to fill the space.

(E)rase. This also removes the block, but other characters remain in place.

(S)ave. This saves only the block (not the whole screen) to disk. See the section on the Alt-S command for more information.

(L)oad. This lets you load data from another file into the screen. The new data appears in inverse video at the upper left corner of the screen. Move the block to the desired location, and then press Enter to stamp the block on the screen. See the Alt-L section for more information.

(R)escan. This command is available only in the Animation mode. It scans the information in the block, adding it to the animated sequence.

More Alt-Key Commands

Here are some additional commands called with the Alt key:

Alt-C clears the current screen.

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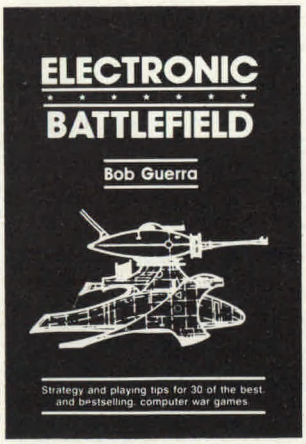

The Electronic Battlefield
Bob Guerra
ISBN 0-87455-117-X
$12.95

This comprehensive reference book on computer war games—how to play them and what strategies to use—will find a place on thousands of computer owners' desks. Whether acting as fierce opponent or impartial referee, the computer is perfect for war game play. *The Electronic Battlefield* offers general and specific hints, tips, and play techniques for all the most popular computer games. Filled with detailed information on such games as *Silent Service, Roadwar 2000, Field of Fire, Arctic Fox,* and *Balance of Power,* this book will appeal to players of all ages and levels of experience. Also included in this book are undocumented features of games like *F-15 Strike Eagle,* command reference charts for many of the games, and even tips from the game designers. The perfect resource for any electronic war gamer.

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Richard G. Sheffield
ISBN 0-87455-127-7
$12.95

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Note: The books do not include any of the software products mentioned.

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The program gives you an opportunity to abort this operation, or to save the current screen before it is cleared.

Alt-D allows you to set the background color to be used when the screen is cleared. This command affects block operations as well. A menu allows you to select the color.

Alt-E switches between the two alternate screens. *TheDraw* lets you keep two screens in memory at once. This command is not available in Animation mode.

Alt-F displays all of the possible function key menus. Use Alt-F to help you choose the function key character set quickly.

Alt-G allows you to make quick changes to the entire screen. After entering the command, a submenu offers you a set of choices:

(C)opy. This selection copies the entire screen into the alternate screen in memory.

(M)ove. After selecting this choice, you can move the entire screen with the arrow keys. Characters which reach an edge of the screen scroll to the opposite edge.

(F)ill. This choice brings up another submenu with the same choices found in the (F)ill menu when you press Alt-B. Here, however, they operate on the entire screen.

(T)ext. Once again, a submenu offers the same choices found in the (T)ext menu when you press Alt-B. Use this selection to draw boxes, to center, or to justify the entire screen.

Alt-H, as mentioned before, displays the help screens.

Alt-I inserts a blank line above the current cursor location. The line at the bottom of the screen scrolls off the screen and is lost.

Alt-K allows you to delete a file in the current directory. A directory of files appears when you press Alt-K, allowing you to make a choice. You can use this command to free disk space if the program tells you the disk is full when you try to save a file.

Alt-L allows you to load a previously created *TheDraw* file from the current directory. The program prompts you to save the current screen, then shows you a directory. Simply type the appropriate filename to load the screen of your choice.

Alt-M toggles *TheDraw* into Draw mode. If the program is already in this mode, Alt-M returns you to Text mode. The current mode is displayed on the status line. In Draw mode, the cursor keys automatically draw on the screen, using the graphics characters in the function key menu. *TheDraw* automatically chooses the appropriate character when lines cross or you change directions. Use this command whenever you want to draw boxes or other figures.

Alt-N places a pair of intersecting rulers on the screen. The crossing point represents the current cursor location. Use it to help you line up rows or columns of characters. Press Esc to remove the rulers.

Alt-O allows you to change the default drive or path while using *TheDraw.* This lets you use several drives or directories to store your screens.

Alt-P allows you to fill a box or other enclosed area with a character or color attribute. To use it, position the cursor inside the box, then press Alt-P. A submenu allows you to select (A)ttribute or (C)haracter or (B)oth, just like when you press Alt-B. Be sure to select your color before pressing Alt-P.

Alt-R restores a line to its original form if you make a mistake while typing in characters. Once you move the cursor off that line, however, Alt-R won't work.

Alt-S allows you to save a screen on disk in a number of formats. When asked for a filename, enter only the filename of up to eight characters; *TheDraw* supplies the extension. A menu then offers the following choices:

(A)nsi. Saving a file in ANSI format preserves all color and other attributes. Files saved this way can be displayed with the TYPE command, but ANSI.SYS must be in the CONFIG.SYS file of the computer used to display the file.

Selecting the Ansi option also presents submenus with other choices. First, you are asked what screen preparation you want before the image is displayed. You can choose (C)lear screen, (H)ome cursor, or (N)one. Normally, you'll choose the (C)lear screen option.

Next, the program asks how long the lines in the saved file should be. For some applications, such as displaying files within another program, you'll have to specify a line length. Normally, you should enter (N)one for the most efficient display.

Finally, enter a number between 0 and 50 to control display speed. Use 0 for the fastest possible display and 50 for the slowest. Experiment with this feature to determine the best speed for your purposes.

Asci(I). This choice allows you to save a simple ASCII file of your screen. All color selections are lost when you make this choice. The program asks you to confirm your decision. Use this format when you want a simple screen display that can be shown with the TYPE command on any PC.

As(M). This format is designed to be used by assembly (machine) language programs. Your choices are (C)runched format, which is not supported in this version; (A)scii format, which sacrifices all color information; and (N)ormal, which is a binary screen dump in assemb-

ler/compiler-compatible format.

(P)ascal. This choice offers you the same possibilities as the As(M) selection. However, the files are saved in a format compatible with the Pascal language. (Registered users of *TheDraw* receive detailed information on using screens within programs.)

(C). This choice saves files in a format which is compatible with the C programming language.

(B)inary. Files saved with this choice are designed to be used with *TheDraw.* These files load extremely quickly into the *TheDraw* editor.

B(S)ave. This choice saves files which can be used in BASIC programs. To display a screen in a BASIC program, use the BLOAD command with the filename of the saved screen. All necessary information is included in the file, and the screen appears promptly.

Setting Tab Stops

Yet another Alt key command is **Alt-T.** This allows you to set tabs in the editor. If your work requires columns or other regular spacing, use Alt-T to save time. By default, tabs are set ten spaces apart.

When you press Alt-T, a submenu offers the following choices:

(S)et. To set a tab, move the cursor to the location of a new tab, then press S to set a new tab.

(C)lear. Removes the tab at the cursor location.

(R)eset. Restores the default tab spacing.

(E)rase. Deletes all tab settings.

(I)ncrement. Sets tabs from the current cursor location to an increment you provide.

Alt-U lets you set the active color selection to the color under the cursor. Use this as a fast way to change to a color already displayed on the screen.

Alt-V lets you look at a previously saved screen. The current screen is not affected, and you can return to it by pressing Enter. Try this command with the demonstration file on the magazine disk, CASTLE.ANS.

Alt-X exits *TheDraw* back to DOS. The program asks you to confirm your choice before quitting.

Alt-Y deletes the current line on the screen. All lines below the current line are shifted up one line, leaving the bottom line blank.

Animation Mode

In addition to Draw mode, *TheDraw* offers a second mode of operation which gives you even more control over your screens. Using Animation mode, you can create screens which move, adding drama to your presentations.

In this mode, *TheDraw* stores each keystroke you type while designing your screen. When you display a screen created in this mode, those keystrokes are repeated in the same sequence. Animated screens can be displayed with the TYPE command on any PC which includes ANSI.SYS as a device driver in its CONFIG.SYS file—even without a copy of *TheDraw.*

To enter Animation mode, press **Alt-J.** The indicator letters *An* appear in the status line at the bottom of the screen. Alt-J also brings up a menu. If the screen is blank, select a menu choice to begin creating your animation. If there's already something on the screen you want to save, choose one of the five scanning methods described below.

(T)op, (B)ottom, (L)eft, or *(R)ight.* These selections scan the current screen starting from the chosen screen edge. When the screen is later displayed, it starts from the edge you choose. All characters entered from then on will appear in order.

(S)cramble. This selection scans the screen in a random pattern. When a screen is displayed, it appears on the screen as it was scanned. Characters entered after the scan will appear in sequence.

Once you've scanned the current screen, you can begin entering characters, using the normal methods described above. These characters are stored in the order you enter them, and they are displayed in that order when you save the file and TYPE it to the screen.

Animation Mode Differences

Some Alt key commands differ slightly when used in Animation mode. The differences are outlined below.

(L)oad, (S)ave, and *(E)xchange.* These block operations are not available in Animation mode.

(R)escan. This block option is available only in Animation mode. It rescans the current block from the direction you specify. The block is erased from the animation sequence, then is rewritten with the new scan.

Alt-C. In Animation mode, this command clears the entire animation sequence. Use with care.

Alt-E. Not available in Animation mode.

Alt-G. The (C)opy and (M)ove options are not available in Animation mode.

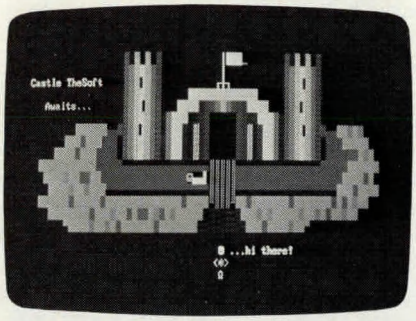
Alt-S. Animation files can be saved in ANSI format only. The other choices do not appear.

New Animation Mode Commands

The Animation mode has several commands which aren't available in the regular Draw mode.

When you press **Alt-J** in Animation mode, a menu offers the following choices:

(N)ormal Mode. This selection allows you to return to the normal (Draw) mode. All animation is lost, but the current screen is carried



The demo included on the magazine disk shows how you can create animated sequences in color or monochrome with TheDraw.

over into the normal mode just as it appears.

(R)escan Screen. This choice scans the current screen, just as it did when you first chose the Animation mode. All previous animation characters entered are lost. Use this option carefully, and only when you want to eliminate previous animation.

(M)ovement Toggle. This option stores *all* cursor movements in the animation sequence. Normally you don't want this to happen, but this option lets you introduce pauses into the sequence by moving the cursor around the screen. This mode is indicated on the status line by a flashing *An* in the middle of the line. Enter or leave this mode with the same command.

The **Alt-Q** combination is another command unique to Animation mode. It redisplays the entire animation sequence, allowing you to see your work as it progresses. After you press Alt-Q, the program asks you to choose a display speed ranging from 0 to 255. Entering a 0 displays the sequence instantly, while a value of 255 displays about two characters per second. A good value to choose is about 40 for most purposes, but this depends on the speed of your computer.

Alt-W allows you to edit the character at the current cursor location. This is necessary because Animation mode simply adds each new character to the animation sequence. Thus, the overtype mode does not work normally. Alt-W allows you to edit characters on the screen without changing the animation sequence.

Alt-Z erases a character at the current cursor location. It erases only the last character to occupy that position on the screen, leaving previous characters at that location in their proper place in the sequence.

Tips For Creating Animation

- Avoid using the Backspace key in Animation mode. If you press Backspace, all characters in the animation sequence which occupy this screen location are erased. This can cause unpredictable results.
- Save animation screens frequently. Since you can't edit an animation sequence, it's easy for errors to creep into a sequence. If you save frequently, you need to reload only the previous version to correct your errors.
- To move an animated block of characters, define a block which includes the characters you want to animate, plus a line of blank characters on the opposite side from the direction of movement. While in the Alt-B menu, choose the (C)opy option. Move the block with the cursor keys, (S)tamping it in position each time you move it. This displays a moving block of characters. The line of spaces acts to erase the trailing characters as the block moves. The speed of the block's movement depends on the speed you select when saving the screen.
- Use Alt-Q frequently to display your animation sequence. Checking your work frequently can avoid time-consuming mistakes.
- Finally, when you've finished your animation sequence, move the cursor to the bottom left corner of the screen. When you TYPE the saved file, the DOS prompt appears wherever you left the cursor. You want it to appear out of your screen area.

As with all programs, experience is the best teacher. Experiment with *TheDraw*, trying out all of its features. Before long, the program will become second nature to you.

A Note About Shareware

Like most programs presented in "Best of the Boards," *TheDraw* is a shareware program which is supported by its users. The author requests a voluntary donation which goes entirely to the author, not to COMPUTE!'s PC Magazine.

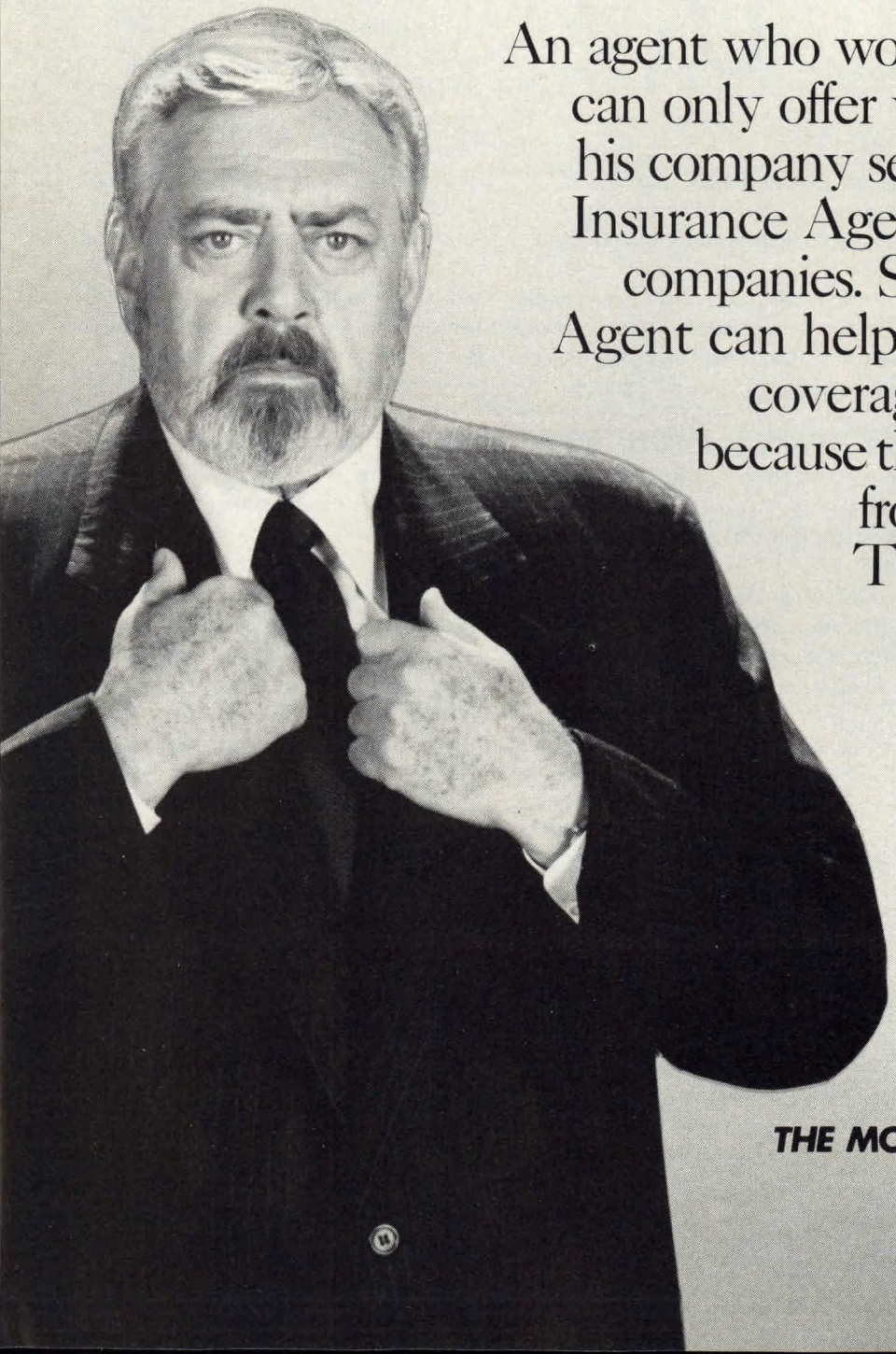
If you use *TheDraw* regularly, you may choose to honor the author's shareware request and become a registered user. If so, the author promises to send you notices of upgraded versions and additional information. Version 3.0 is currently in the works, and will offer additional features.

To register, send $10 to TheSoft Programming Services, c/o Ian Davis—*TheDraw*, 1929 Whitecliff Ct., Walnut Creek, CA 94596.

COMPUTE!'s PC Magazine provides these programs for the use of our readers. Programs like *TheDraw* are normally distributed with documentation and other files. Please do not distribute these programs to others, since important documentation would be missing. **PC**

"Before you buy insurance, examine the evidence."

RAYMOND BURR



An agent who works for one company can only offer you the policies that his company sells. An Independent Insurance Agent represents several companies. So your Independent Agent can help you select the right coverage at the right price because there are more policies from which to choose. The evidence is clear.

Independent Insurance Agent.

THE MORE-THAN-ONE-COMPANY INSURANCE AGENT.

You'll find the Independent Insurance Agent nearest you in the Yellow Pages.

A *Flight Simulator* Adventure

Flying Home

Tiedown Concepts For Flight Simulator

Microsoft's Flight Simulator *is one of the most popular programs available for IBM PCs and compatibles, and many thousands of PC owners enjoy an occasional tour through the clouds. This article introduces you to scenic attractions at the more interesting airports in the simulator world and shows why you should establish a "home base" from which to fly. A copy of Microsoft's* Flight Simulator *and SubLOGIC's* San Francisco Star Scenery Disk *is required. Charles Gulick is the author of* 40 Great Flight Simulator Adventures *(COMPUTE! Books, 1985),* 40 More Great Flight Simulator Adventures *(COMPUTE! Books, 1986),* Flight Simulator Co-pilot *(Microsoft Press, 1986),* Runway USA *(Microsoft Press, 1987), and* Flying Flight Simulator *(Microsoft Press, 1987).*

You feel like doing some flying. But from where? And to where? With the simulator world ever widening, the choices can be overwhelming.

Charles Gulick

So you sit and stare down the Meigs runway, undecided (with six impatient pilots behind you, waiting for you to make up your mind).

Private pilots in the real world (particularly student pilots) have far fewer alternatives. They normally fly local or cross-country. *Local* means they take off from and fly in the general area of the home airport, and then return there. *Cross-country* means they fly from the home airport to another airport in the area, visit the coffee shop (and get their logbook signed if they're students), and then take off and fly home again. Sometimes they'll visit more than one other airport, typically just for the experience of flying a triangular course. But always, the home airport is the ultimate destination.

In simulator flying, too, the concept of a home airport can be very satisfying. And, of course, you're not limited to just one. You can create a home base for each chart area—New York/Boston, Chicago, Seattle, and Los Angeles—as well as for the areas covered by each *Scenery Disk* you own. Ideally, each home airport will be your favorite in the area, either because it is scenically satisfying, is near where you actually live, or—if you're a real pilot—is the airport from which you actually fly.

Dullsville

The scenic aspect of the home airport is something to consider; many simulator airports simply are not scenic. The majority of them consist of a runway or runways, an endless stretch of unrelieved ground, and a limitless vault of cloudless sky. This is okay when you're flying to an airport, because you're concentrating on your approach and landing. But it doesn't make the airport a very inviting place to fly from.

By contrast, there are some simulator airports which are relatively beautiful, or at least visually interesting, if you park your airplane in the right place. These, to my mind, are the home airports of choice.

What makes a simulator airport relatively beautiful, visually interesting, or both? First of all, I prefer water. If an airport has a runway which is close to a body of water, and if you tie down your aircraft using some design ingenuity, you'll enjoy flying out of that airport every time. Water lends a quality of peacefulness to a scene, in the simulator as in real life.

The same is true of mountains. They, too, add to the aesthetics we look for in a home airport. Both water and mountains help us imagine that what we're doing in the simulator is real—which is the essence and the objective of simulation. If we can imagine that we see part of a real runway, a stretch of real grass, and a real body of water through our windshield, it doesn't take too much more imagination to

believe that all these are as beautiful as they are in the real world.

If you're anything like me, you have a genuine affection for your Cessna, for all it can do, and for all of the wonderful places it can take you. You even develop an affinity for the simulator world itself and come to find it inherently believable.

So realism is, if not beautiful, at least more believable and thus more interesting. For this reason, anything vertical in a scene adds immeasurably to the interest. The real world is full of vertical things; the simulator world, notably sparse in them. Any airport, therefore, that gives us something vertical to stare at seems more realistic than those which are unswervingly flat.

Besides mountains, some simulator airports offer such vertical features as a pilot shop, city buildings or a skyline, or a bridge. In two rare cases, we find a hangar or hangars, and in one outstanding case you can even see a control tower (the only one in the simulator world, as far as I can determine, but it's a beauty).

Water, mountains, and vertical features: Alone or in combination, these distinguish the graphically more interesting simulator airports and, thus, the more desirable selections for home airports. Then we must position our plane—put it on a runway threshold, park it on the tarmac, or tie it down somewhere on the grass—to take maximum advantage of these features. This takes a little imagination and a lot of taxiing. But the nice part is that you become something of an artist as you design your location. You can set things up to suit your own tastes.

Lakefront Chicago

By way of example, boot your simulator now, and I'll transport you to a few of my own favorite home airports.

First, not to slight Meigs Field (the default home airport), I have my tiedown there just behind and to the left of the threshold of runway 18. You can duplicate it in the Editor by setting north and east positions to, respectively, 17191 and 16671, with the aircraft heading 176 degrees. As always, set altitude to 0; the simulator will find the correct altitude.

Note that the notch in the shoreline puts a little of Lake Michigan in the scene, adding variety to the landscape, and that the pilot shop is still somewhat three-dimensional at this distance. There are also two buildings on the horizon (though admittedly small, they're at least vertical). I'm close to the business end of the runway, thus ready to go at a moment's notice. A view out the right side reveals the 110-story Sears Tower, partly obscured by the wing. A view directly to the rear puts the John Hancock Building and other skyscrapers in the scene.

This tiedown may or may not be to your liking, but on Meigs you haven't many choices. This brings up an unfortunate aspect of *Flight Simulator.* You can taxi smoothly to almost any location, as long as there is still ground under your wheels. But you can't save a location precisely. One digit in any direction makes a big difference in location.

For example, if you add or subtract 1 from the east position parameter here, you'll go to the bottom of either Lake Michigan or Burnham Park Harbor. So we have to temper our desire for perfection with the gross realities of integer positioning. That's why it takes much trial and error to find the optimum location for a permanent (that is, saved-to-disk) tiedown. But wouldn't you rather depart Meigs from here than from a third of the way up runway 36? And who ever leaves their airplane parked in the middle of a runway?

Scenery At Kankakee

My own favorite airport in the Chicago area is Greater Kankakee, not so much for the airport itself as for the chance it affords for scenic flights tracking the Kankakee River, and for flights southward over the grid. But the airport, too, is interesting. It has a ramp and taxiways—both of which always add realism—and two strips, 16/34 and 04/22.

At Greater Kankakee, I park at north position 16845, east position 16596, heading 034 degrees. Try it on for size. The pilot shop adds vertical interest, and the interplay of grass and tarmac contributes a nice design touch.

A good candidate for a home airport in the Seattle area is Tacoma Narrows. My tiedown there is precariously close to Commencement Bay, but the scenery is a real grabber. Put this into your Editor: north position 21300, east position 6479, heading 083.

How would this view appeal to you after a hard day at the office? Make you want to go flying? Me, too. That's Mount Rainier, of course. And take a look at the runway on radar. You can elect to face the challenge—taxiing out to the end of runway 35 and turning around (on a dime) for your takeoff. Or you can choose the more scenic route, departing on runway 17 and climbing out over Commencement Bay.

The strip is about 5000 feet long and 150 feet wide, so there's room to turn around for 35. But proceed carefully in all operations this close to water; a look in the wrong direction, and you could take a bath.

Enter The *Scenery Disks*

The *Scenery Disks* offered by SubLOGIC are making simulator flying more rewarding than ever, while

expanding our horizons almost limitlessly. The *San Francisco Star Scenery Disk* was just the beginning; it set the tone, and no simulator pilot should be without it. With *Scenery Disk 7*, covering Washington, DC to Key West, Florida, the graphics are really taking off. Suddenly, in place of endless green earth, we have a landscape shaded in tones of light and dark—a logical and relatively simple upgrade which adds immensely to the feeling of realism in flight. You can really believe that's Earth down there.

Over Cape Canaveral, you'll spot the space shuttle on its launch pad. And in Washington, you can land on the Mall and taxi right up to the White House steps. The monuments—and even the reflecting pools—are in place.

Then comes *Scenery Disk 11* with still more upscale stuff, including a couple of gliders and a hot-air balloon sharing the skies with your Cessna.

Assuming you may not yet be blessed with *Scenery Disks 7* and *11* (what are you waiting for?), we'll use the *San Franciso Star Scenery Disk* for examples of tiedowns in this new geography.

I mentioned earlier that there is one airport (and, as far as I've been able to determine, only one) in the simulator world that features a control tower. It also happens to be one of the most realistic and satisfying home airports you'll find in the San Francisco Bay area. If you're not familiar with it, you'll want to be. Here's how to get there.

Go into the Editor and set north position 17303, east position 5251, heading 250. Hold your breath and exit the Editor.

Isn't that a beauty? You're at Livermore Municipal Airport in Livermore, California, parked just a little ahead of the threshold of runway 25. You have plenty of runway ahead, so you can simply taxi to your left, get into position, and go. If you tune your NAV radio to the San Francisco VOR (115.80) and center the Omni-Bearing Indicator (OBI) needle, you'll see that San Francisco International is virtually straight ahead and only about 31 miles on the Distance Measuring Equipment (DME) from where you're sitting.

Mammoth Hangars

There's one other airport in the Bay area I'd like to show you, in case you're not familiar with it. Set north position to 17221, east position to 5135, and heading to 119 degrees.

There's no mistaking that you're at an airport, right? This is Moffett Field Naval Air Station (NAS) in Mountain View, California, at the foot of San Francisco Bay. You're looking at two of its three giant hangars (you can see the third one out the right side). These are old dirigible hangars, and you can taxi into one to get a better idea of their dimensions.

These hangars, like the control tower at Livermore and other special features in *Flight Simulator* (bridges, buildings, pilot shops) easily escape detection from the air, because they become dimensional only when you're quite close to them. That's why one airport is as good as another when you're flying into it; the vertical features, if any, are usually obscured.

But in the case of the dirigible hangars, they become dimensional while you're still several miles out, and thus make Moffett NAS perhaps the most distinctive airport in the San Francisco area. You can even see them—quite imposing on the horizon—when you're on the ground at the Palo Alto airport, heading about 106 degrees.

No Place Like Home

There are numerous good reasons for establishing a home airport or airports in each major simulator area. You can personalize your tiedowns, views, and operations, and then save them to disk. You can park on the tarmac (if there is any) at a location central to all runways or tie down close to your preferred runway. You can design the view to suit your aesthetic instincts, creating an environment where you feel comfortable when you climb aboard. You can be "at home" close to a big city, or far out in the country. When you want to show off the simulator to a friend, you're ready with a carefully prepared scenario that shows it off to maximum advantage.

When you fly regularly from your home airport and just as regularly return to it, you become intimately familiar with operations there—approach procedures, field elevation, the airport traffic pattern, runway numbers, and your own parking spot (make it a habit to taxi back to that spot when you've come home and landed the airplane). You also become more finely tuned to the geography and the major landmarks of the whole area. If your base were Moffett Field, for example, you'd have no trouble flying home from anywhere in the Bay area, without relying on any navigation aids except your eyes. You'd simply track the Bay south, and watch (you'll soon know just where) for the airport with the two parallel runways and the can't-miss-'em blue hangars.

Get to know the major landmarks in the area of your home airport, too. An ordinary road atlas is all it takes. *Flight Simulator* is amazingly true-to-life in respect to highways and bodies of water. Most of the highways simulated are Interstates, and you'll find their names in an atlas. When you're acquainted with the highways, you'll know where they lead and where various airports are located in relation to them.

Bodies of water (particularly smaller ones, such as reservoirs) are faithfully reproduced and will become familiar guideposts, too. The shape of metropolitan areas in the simulator roughly approximates those shapes in an atlas, and the shapes themselves frequently have corners that point in some relationship to specific runways.

All of these things help you orient yourself when you're in the air and add to both the professionalism and the pleasure of flying *Flight Simulator*—and, in particular, flying home. **PC**

FileFinder

Mark J. Fenbers

If you organize your disks with lots of subdirectories—and especially if you have a hard disk—this utility can be a real timesaver. It quickly searches your disks to find files for you, and it also has the unique ability to carry out DOS commands throughout an entire disk. It runs on any IBM PC, XT, AT, or compatible with DOS 2.0 or higher. Printer optional.

Are you frustrated because you can't find files that are lost somewhere in nested subdirectories? Have you forgotten whether your lost file is called DATA.TXT or DATA.DOC? Rather than searching bleary-eyed through your disks with DIR commands, let "FileFinder" find it for you. In seconds, FileFinder searches through all directories and subdirectories on a disk, and then tells you every directory that contains the target file.

FileFinder allows you to use wildcard characters when specifying a filename, so with a little experimentation, you can find almost anything resembling the missing file. FileFinder even finds system and hidden files.

These functions alone make FileFinder worthwhile, but there's much more. FileFinder has several options for narrowing down the search; for finding subdirectories instead of files; for providing information on file sizes, attributes, and dates; and for executing any DOS command on any files it uncovers—throughout an entire disk.

Starting FileFinder

You don't have to search very hard for FileFinder—you'll find the program on the magazine disk under the name LOCATE.EXE. To run it, enter LOCATE at the DOS prompt, followed by a space and the name of the file you're looking for. Here's an example:

```
LOCATE MYFILE.TXT
```

FileFinder looks through the current directory and all of its subdirectories for MYFILE.TXT. You can substitute any filename for MYFILE.TXT, of course—the name of a text file, a .COM file, an .EXE file, or any other type of file.

You can also tell FileFinder to search for more than one file at a time. Just enter both filenames after LOCATE, on the command line, separated by a space. Example:

```
LOCATE MYFILE.TXT YOURFILE.TXT
```

If FileFinder finds the file you're looking for, it shows the directory and subdirectory (if any) where the file is found. For instance, if it finds MYFILE.TXT in the \WORKS directory, it displays this:

```
\WORKS \MYFILE.TXT
```

If it finds MYFILE.TXT in the \ITEM directory within the \WORKS directory, it displays this:

```
\WORKS \ITEM \MYFILE.TXT
```

When FileFinder locates more than one copy of the file, it lists where it finds each one. When it doesn't find a file you're looking for, it displays nothing.

Note that you can enter FileFinder commands in either upper- or lowercase. FileFinder considers them the same and automatically converts them to uppercase.

Search Limits

FileFinder begins its search in the current directory, and searches only this directory and any subdirectories within it. In the example above, it searches the \WORKS directory and the \WORKS \ITEM subdirectory. If a subdirectory called \WORKS \COST exists, it searches that, too.

However, FileFinder normally won't search beyond the boundaries of the current directory and its subdirectories. To make it search beyond these directories, you must give it some special instructions. Suppose, for example, the current directory is \PGMS instead of \WORKS, and that \PGMS is not a subdirectory within \WORKS. If you run FileFinder from within \PGMS, it won't look for the file in \WORKS.

There are two ways to make FileFinder search for a file in every directory and subdirectory on a disk drive. The first is to change directories to the root directory of the drive. To do this, enter:

```
CD \
```

Since all directories and subdirectories on the drive are under the root directory, FileFinder searches every directory and subdirectory on the drive.

Another way to search directories outside the current directory is to specify the name of the directory to be searched. You can, of course, specify the root directory. If you enter this:

```
LOCATE C:\MYFILE.TXT
```

FileFinder searches every directory on drive C regardless of the current directory. Note that C:\ in this example refers to the root directory of drive C. Entering the drive letter plus a backslash is the way to indicate

the root directory of the drive. The backslash character must be included.

If you want FileFinder to search only a certain directory and any subdirectories it contains, you can do it in the same way. For example, to search only the \WORKS directory and its subdirectories, enter:

```
LOCATE C:\WORKS\MYFILE.TXT
```

Then, FileFinder searches for MYFILE.TXT in \WORKS and in of all its subdirectories.

If you want to search only the parent directory, \WORKS, without searching its subdirectories, \WORKS\ITEM and \WORKS\COST, you can do so by appending a switch to the command, as we'll describe in a moment.

Searching For Directories

In addition to finding files, FileFinder can also find subdirectories. Simply enter the name of a subdirectory instead of a filename; FileFinder reports the name of the directory that's above it in the directory hierarchy. For example, if you enter:

```
LOCATE ITEM
```

FileFinder responds with:

```
\WORKS\ITEM
```

Notice that you don't need to type the backslash character when specifying a subdirectory to search for.

This feature can be useful if you happen to have a file and a directory with the same name. You may also have subdirectories with the same name, but which are located under different parent directories.

Wildcard Characters

For added versatility, you can use wildcard characters in any file specification with FileFinder. A wildcard is a character that represents other characters in a filename. FileFinder recognizes two standard DOS wildcard characters: the question mark (?), which represents any single character, and the asterisk (*), which represents any combination of characters. FileFinder uses these wildcard characters just as DOS does. If you're not familiar with the use of wildcard characters, see your DOS manual for details.

Wildcards make it easier to find files when you can't remember the exact filename. Suppose you wrote a letter with your word processor, but you can't remember whether you called it LETTER.DOC or LETTER.TXT. You can use FileFinder with wildcards to find it for you. If you enter:

```
LOCATE C:\LETTER.*
```

FileFinder searches every directory on drive C and reports the location of either LETTER.DOC, LETTER.TXT, or any other filename that begins with LETTER and ends with any extension.

Wildcards also make it easy to search for a particular type of file. Suppose you want to know where all of your BASIC programs are located. Enter the following:

```
LOCATE C:\*.BAS
```

FileFinder provides you with a complete list of files on drive C that end with the extension BAS.

FileFinder Switches

You can use FileFinder as described above without any frills, but it also has several switches for controlling special features. You can think of these switches as minicommands that modify the action of FileFinder in some way.

Here's FileFinder's complete command-line syntax, showing the optional switches:

```
LOCATE [-PDFNLX] [command] [drive] [directory\] filenames
```

Brackets indicate optional entries; don't type the brackets. You can enter these options in either upper- or lowercase letters. Precede any switches with a minus sign (-).

For example, the -P switch sends FileFinder's output to the printer instead of the screen.

```
LOCATE -P filename.ext
```

This is useful if there's more output than fits on the screen (perhaps a long list of the locations of every BASIC program).

There are several other switches. Any of these can be used in combination with each other; just precede the first switch with a minus sign.

-D Tells FileFinder to search for directories instead of files.

-F Tells FileFinder to search only for files, not directories. You may wonder why this switch is needed, since FileFinder searches for files by default. The answer is that it's useful if you have files and subdirectories with the same name, or—in combination with the -X switch—if you want to be sure that a command is executed only on a file, not on a subdirectory.

-N This switch prevents FileFinder from looking for files anywhere else but in the specified directory. It won't look for the file in any other directory or in any subdirectories under the specified directory. For example, if you enter:

```
LOCATE -N C:\WORKS\MYFILE.TXT
```

FileFinder reports any occurrence of MYFILE.TXT in the \WORKS directory, but not in \PGMS, a different directory that might be on the same disk. With the -N switch, FileFinder also won't search subdirectories of \WORKS, such as \WORKS\ITEMS or \WORKS\COST.

-L This switch tells FileFinder to list file information in the long format. In other words, the program lists the name of each directory it searches, and when it finds a file, it displays the file type, date, time, and size in bytes. When the search has ended, FileFinder lists the total number of directories it has searched, the number of both files and directories it has found that match the filename you entered, and the total number of bytes used by the files it has found.

Switches may be combined on the command line. Precede the first switch with the minus sign, then just tack on the rest. For example, if you enter:

```
LOCATE -LP C:\WORKS\MYFILE.TXT
```

FileFinder uses the long format when it finds files, since the -L switch appears, and also sends the report to the printer because of the -P switch. Note that you can enter switches in any order, and that you need to enter the minus sign only once.

If you forget what the switches are and what they do, you can call up a help screen by entering LOCATE at the DOS prompt, with no other parameters:

```
LOCATE
```

The help screen describes the switches and displays the command-line syntax.

The Execute Switch

There's one more switch we've saved for last, because it's the most powerful switch of all. This switch can change the very nature of FileFinder and turn it into a global DOS command utility.

It's called the -X switch (for eXecute). This switch tells FileFinder that whatever follows the switch isn't a filename you want it to find; instead, it's a DOS command you want it to execute. Following the command, enter a filename or directory name as required. You can use wildcards. FileFinder then searches for the file or directory you specify and executes the command on anything it finds.

The following example executes the TYPE command on any files on drive C ending with the filename extension .DOC:

```
LOCATE -X TYPE C:\*.DOC
```

Notice how the -X switch tells FileFinder that what follows is a command—in this example, the TYPE command. Next is the description of the files on which this command will be executed. Since the wildcard file description is preceded by the root directory indicator (C:\), FileFinder knows that it must search all directories on drive C for .DOC files, and then TYPE each file on the screen.

Here's another example. The following command displays a directory listing for all directories or subdirectories named \HELP:

```
LOCATE -XD DIR C:\HELP
```

The -D switch tells FileFinder to search for directories only, and the -X switch tells it that what follows is a command. When FileFinder finds a directory named \HELP, it executes DIR.

DOS Commands With Spaces

One problem is when you must enter a DOS command that contains a space character. Since FileFinder uses space characters to separate parameters, some confusion might result, but there's a way to avoid this confusion. For instance, here is the DOS command for displaying a wide directory:

```
DIR /W
```

To execute these kinds of commands with FileFinder, you must use a special symbol to represent the space. The special symbol is the caret (^), Shift-6 on most keyboards.

The special space symbol tells FileFinder that what follows the space is part of the command, as /W is a part of DIR in the example above. So to make FileFinder display a wide directory listing for any directories named \HELP, enter the following:

```
LOCATE -XD DIR^/W C:\HELP
```

Notice that the space following DIR has been replaced with the caret.

Combining Commands

Here's another example. Suppose you have a directory called \BASIC, and you want to copy all .BAS files in the current directory into the \BASIC directory. To do this with DOS, enter the command:

```
COPY *.BAS C:\BASIC
```

To instruct FileFinder to find every BASIC program on the drive, you would use this command:

```
LOCATE C:\*.BAS
```

There's a way to combine these two commands into one megacommand that copies all BASIC files from every directory on the drive to the \BASIC directory.

To do this, you must use another special symbol, the dollar sign ($). It acts as a placeholder for filenames when a filename appears in the middle of some command that you want FileFinder to execute. Here's the command, which copies every .BAS program on drive C to a directory named \BASIC:

```
LOCATE -X COPY $ C:\BASIC C:\*.BAS
```

The -X switch tells FileFinder that a command follows. The command is:

```
COPY $ C:\BASIC
```

The $ is a placeholder for filenames found by FileFinder, and it's one parameter of the COPY command. When FileFinder finds a file that matches the file specification, it copies the file to the \BASIC directory. The remaining part of the command line describes the files FileFinder must look for:

```
C:\*.BAS
```

The result is that FileFinder copies every file with the .BAS extension to the \BASIC directory.

Note that in this example, spaces instead of carets surround the dollar sign. When you use the dollar sign, you don't need to substitute carets for spaces.

Running Programs With FileFinder

So far, we've seen that FileFinder is both a file-search utility and a global DOS command utility. But that's not all it can do; it can run programs as well.

The procedure is simple: Just use the -X switch

and enter the program's filename on the command line where you would normally enter a DOS command. If the program needs parameters, replace any spaces with carets, just as you do when entering DOS commands.

The following example runs the DOS FIND program (it's called FIND.COM on your DOS disk). It counts every occurrence of the phrase DEAR SIR in every .DOC file on drive C. It also redirects the output of the FIND program to a file in the root directory called COUNT. (See instructions for using the FIND program in your DOS manual.)

```
LOCATE -X FIND^/C^"DEAR^SIR" C:\*.DOC > C:\COUNT
```

Remember that FileFinder translates everything on the command line to uppercase. Therefore, when it passes parameters to the FIND utility, the search string is converted to uppercase, which means that occurrences of DEAR SIR will be reported, but not occurrences of *Dear Sir*. Despite this limitation, the example illustrates how FileFinder can make almost any other utility program more powerful by executing it globally over a whole disk.

Caution Is Advised

Because of its power to carry out commands in a sweeping fashion, FileFinder can be dangerous when used carelessly. Be cautious when using the −X switch with certain commands that are difficult to undo, such as DELete. For instance, the following example deletes all files in the current directory:

```
LOCATE -X DEL *.*
```

That could be bad enough, but the following line *deletes every file on drive C*:

```
LOCATE -X DEL C:\*.*
```

If drive C happens to be a 40-megabyte hard disk, you might set a local record for The Most Files Accidentally Wiped Out In A 30-Second Period.

As a safety feature, FileFinder is designed to warn you, in most cases, if there's a danger of removing all files on a disk. But it's better to avoid these kinds of commands in the first place.

Note To Programmers

FileFinder was written in C and compiled with the *ECO C-88* compiler by Ecosoft. You'll find the source code for the program on the magazine disk in a file called LOCATE.C. A companion file is named RIGHTS.C. These files are not executable programs; they are for programmers who are interested in studying how FileFinder works. **PC**

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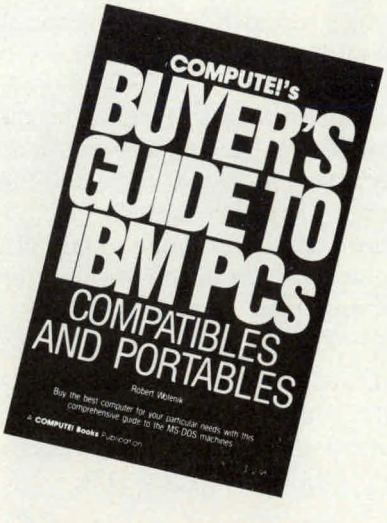
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Northgate C/T Intelligent Keyboards

Keith Ferrell, Features Editor

System requirements: Any IBM PC, XT, AT, or compatible with a circular five-pin keyboard connector. (Some early ATs cannot recognize 101-key keyboards without new ROM BIOS chips.)

I like a keyboard that clicks. Maybe it's my typewriter training, but even the best PC keyboards have always lacked that combination of aural and tactile response that lets me know I'm typing. I'm not, by the way, a touch typist; my typing technique is wholly my own, and I've discovered that it depends a lot on ear and finger feedback from the keyboard. Too many PC keyboards have all the play and sound of a courtroom stenographer's machine. This seems especially true of the keyboards that come with some compatibles.

Then there's the question of space. Many manufacturers seem determined to pack as many keys into as small a space as possible. My fingers get in each other's way, and the number of extra characters inserted into words becomes annoying.

Personal Preference

Fortunately, most PCs come with a circular five-pin keyboard connector, which means you can change keyboards easily, assuming you can find one you prefer.

One keyboard I prefer is Northgate Computer Systems' C/T Intelligent Keyboard, and it satisfies all my criteria. The C/T (Click/Tactile) keyboard comes in two configurations: an 84-key standard PC version and a 101-key AT version.

Installation is simply a matter of unplugging your old keyboard and plugging in the new one. As the manual points out, though, you should turn off the computer first (always a good practice when connecting or disconnecting any device to a computer). This is particularly important when hooking up the C/T 101 keyboard, because it recognizes the ROM BIOS chips of the computer to which it is connected, initializing itself appropriately.

Northgate points out in the manual that some of the original IBM PC AT computers that came with 84-key keyboards have ROM BIOS chips which won't recognize larger keyboards. The chips must be upgraded if you want to hook up a 101-key keyboard.

Likewise, some software does not recognize 101-key keyboards, including some macro programs and cursor speed-up utilities. I had no difficulty using one such utility, *Cruise Control*, but Northgate recommends contacting the software manufacturer for an upgrade if you encounter problems.

Design Considerations

The keyboards themselves are models of solid construction and elegant design. Northgate has provided plenty of space between the keys; both keyboards are designed for *use*. And when they're not in use, they look good on the desk. The keyboards are slightly curved, giving them a sculptured appearance.

The numeric keypads are spacious and easy to use, and the Enter keys are *L*-shaped. The C/T 101 has a separate cursor keypad and 12 function keys.

Both the C/T 84 and C/T 101 have three LED lights to indicate the status of the CapsLock, NumLock, and ScrollLock keys. The CapsLock key is oversized and comfortably separated from the Shift key, unlike CapsLock on many keyboards, where it is nearly impossible to hit Shift without locking yourself into uppercase.

When you pick up a C/T keyboard, you immediately notice its weight. The base is metal and the body is molded of hard plastic. No matter how fast or furiously you type, the keyboard stays in place. Flip-down legs add to the gently angled sculpture of the keyboard, and even when the legs are in use, the board does not move when I bang away.

The manuals are well organized and clearly written. Northgate offers a three-year unconditional warranty on the keyboards.

I was surprised to discover how these keyboards increased my productivity. My ears can tell when my fingers have mistyped, and when I'm flying across the keys, my fingers get the kind of feedback they evidently need. As far as I'm concerned, C/T could also stand for Certainly Terrific.

Northgate C/T Keyboards
Northgate Computer Systems
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QuikSave

Bob Gingher

Requirements: Any IBM PC, XT, AT, Personal System/2, or compatible with at least 256K of memory. Works with single- or double-sided floppy drives, 720K and 1.2-megabyte floppies, and all hard disks.

Like practically everybody, I depend on my computer for three things: storing, retrieving, and revising information. I depend on the information, too, meaning that a reliable backup program is a must.

For years I was satisfied with the MUFBACK and MUFREST standard programs of the CP/M operating system, and later—with MS-DOS—the BACKUP and RESTORE utilities. But there were considerable problems, it turned out, with both systems. For one thing, MUFBACK was intolerably slow. If you're going to back up ten megabytes of documents and data, as I had to do with my Kaypro 10, kiss your morning goodbye. Then I had to use MUFLOOK to check out which files were on the floppy, all of it accomplished at a rate which seemed to assume that this much busywork was fun. It wasn't.

BACKUP and RESTORE have their drawbacks, too—which led to the catastrophe. There were three ingredients: a brown-toned floppy disk that I used as one of the backup floppies; a computer maintenance fellow who reformatted my hard disk with a nice multiuser edition of MS-DOS that was distinctly unfriendly to BACKUP/RESTORE; and an electrical storm.

There is some comfort in not knowing whether it was user incompetence, a faulty disk, bungled repair, an act of God, or all of the above. In any case, my several-thousand-entries-long database could not be restored from the floppy. We ran RESTORE any number of times, but despite software and prayer, the data file had evaporated to that resting home of data bytes which threatens all users, and there was nothing to do about it. Believe me: I tried *everything*.

As always when you explain a loss to someone, you hear: "I can't believe you even used BACKUP and RESTORE. That went out with the Edsel. It's undependable." Clearly, it was time for a new approach. Friends recommended *Fastback*.

It turned out that *Fastback* was fine, speedy and dependable. You still owned your morning, and you could rely upon the backup as something which could be restored.

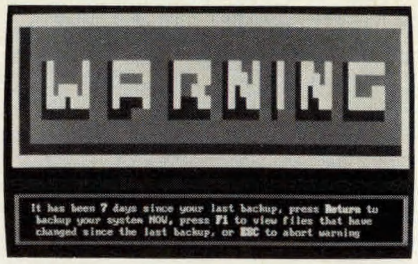
Enter *QuikSave*

Now *QuikSave* is here. I've tried it and like it. In addition to the speed and reliability of *Fastback*, *QuikSave* features a warning screen that lights up like something out of *War Games*, a catalog system like *Fastback*'s, and a wide array of options to customize the program for your own needs.

You can install *QuikSave* in a few minutes and immediately take advantage of its ability to automatically search your hard disk to detect and correct disk errors. Then you can ask the program to start keeping track of the time and date. If you begin your week by setting *QuikSave* for regular backups every three days, by Thursday you'll get a dramatic screen warning. The backup routine you ran Monday morning is three days old now; time for a new one.

QuikSave lets you choose whether you want all files backed up again or just the files which have changed since your last backup. Do you want all the files on your hard disk backed up, a particular combination of files, or just those from a particular directory or subdirectory? For most purposes an incremental backup of files that have been changed is the reasonable elective, and *QuikSave* allows this.

If you want the files verified as they're backed up, the process takes about twice as long. Still, the manual highly recommends the verification procedure, and *QuikSave* still flies at Mach 3 compared to the old MUFREST business. If you make backups every day, you could save a little time by skipping verification occasionally.


WARNING
It has been 7 days since your last backup, press Return to backup your system NOW, press F1 to view files that have changed since the last backup, or ESC to abort warning

QuikSave *flashes a warning screen to remind you that it's time for your regular backup.*

More Options

QuikSave also lets you choose the number of days between backups, whether you want to be warned when backups are due (why would anyone *not* want this option?), and whether you want *QuikSave* to check the date automatically. If your computer system lacks a battery-powered clock, you can enter the time and date manually. In addition, you can choose to have *QuikSave* back up only those files which have been altered since the most recent backup.

QuikSave lets you pick as many as five kinds of files you want included in or excluded from your backup routine. Usually the files you'd want to exclude would be those you already have backups for, such as the command files (*.EXE and *.COM) and others.

It's nice to have a backup program that reminds you when to make your backups—every day, every week, or whatever schedule you (and as many as nine other users) dictate. When it comes to backups, you'd better believe that's an important date to keep.

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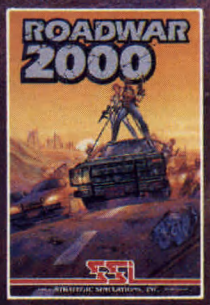

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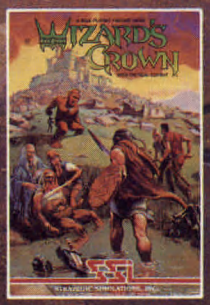

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Robot Rascals

Ervin Bobo

System requirements: Any IBM PC, XT, AT, or compatible with at least 256K of RAM and a color/graphics adapter (CGA) or equivalent built-in hardware; joysticks optional.

Years ago, after setting up my first computer, the four members of my family would cluster in front of the monitor as *Gorf* and *Sea Wolf* and *Clowns* unfolded—two of us playing and the other two waiting to take their turns.

There are four computers in the house now, and the situation is alleviated. At least it was until we acquired a copy of *Robot Rascals*, a combination card/computer/board game for two to four players. Now we cluster before the PC, waiting for our turn at the keyboard. If it seems that nothing has changed, we can take some comfort in knowing that even the momentarily passive players are affecting the outcome of the game.

In essence, *Robot Rascals* is a computerized scavenger hunt. The objects for which you must search are shown on item cards dealt at the beginning of the game. Another stack of cards—the luck deck—must be drawn from before each turn. They may affect your actions during the turn, or they may be used to reduce another player's chances of winning.

Search And Retrieve

Your computer provides both the board and the play action. The board is the landscape over which your robot travels as you send him in search of such things as a Pixel Pencil, a Silicon Salad, a Chocolate Chip, and so forth.

The computer also supplies your marker, in this case a robot. There are ten robots from which to choose, each with different characteristics. At this point, your robot is also assigned an energy level, though in higher levels of the game you can set this as you please. The energy level determines how far your robot can go during a turn.

At the outset of the game, each player is dealt four cards. Depending upon the level of play selected, these may be all item cards (beginning level) or a mixture of item cards and Killer, Cheat, and Wild cards. Once this is done, you begin the computer portion of the game by selecting the robot you wish to use in your quest.

Turns are selected at random by the computer. When it's your turn, you move the cursor across a menu until you've selected the item for which you wish to search. (Ideally, this is an item whose matching card you hold, but not necessarily.) Then you'll see an action menu, from which you can choose to scan or move. Since scanning requires more energy, there will be times when simply moving will carry you farther.

Once these choices have been made, it is time to consider the entire playing screen.

Scanning The Screen

At the top of the subdivided screen is an information bar that shows the player currently playing and the number of the turn being taken. On the right, a window shows your robot and its energy level, while on the left is an overview of the entire playing field, complete with forests, swamps, and teleport stations.

In the center of the screen is an enlarged portion of the field. Here is where your movements are displayed. Just below, a smaller window shows the objects you've collected. Below that is yet another window showing your condition and—now and then—a helpful message.

If all this seems confusing and cluttered, it is not. It takes no longer to become accustomed to this than to any other new playing screen.

Though scanning costs energy, it is the operation you'll use most often. A robot scans for your chosen item by spinning about. Its proximity to the item is related to the speed at which it spins. Once the spinning stops, the robot indicates by its stance and by a written message which direction you should go. Use the joystick or cursor keys to move it a bit, and then scan again. (If you recognize an analogy to the children's game where we exclaimed, "You're getting warmer," "You're getting colder," and "You're red hot"—well, now you know the roots of at least one computer game.)

When the robot is close enough to retrieve the item, it spins wildly and takes possession of the object by pulling it in with a tractor beam. But because energy diminishes as you move and scan, you probably won't reach this point in one turn.

Object Lessons

The object of *Robot Rascals* is to gather all your objects and return with them to home base, using the teleport system to get there as quickly as circumstances allow. The problem is that the objects and the circumstances will change as the game is played. You may be forced to trade cards with another player, thereby losing an item for which you've searched; another player may steal an item from you; or another player may seach for one of your items and drop it in a lake—where it remains until the program tells you the lakes have dried up.

Some of these hazards come as a result of cards drawn from the luck deck; others are the result of a particular player's strategy. Another strategy is to collect items that are the opposite of the cards you were dealt. (Cards are good, bad, or neutral; if you were dealt four good items and return home with four bad items, you can win.)

When you do get to home and claim a win, any other player can check the truth of the win by pressing a function key. Though you may be tempted to bluff, it won't stand up to the computer's record of the action.

Robot Rascals is different in that it combines elements of card, board, and computer games, and

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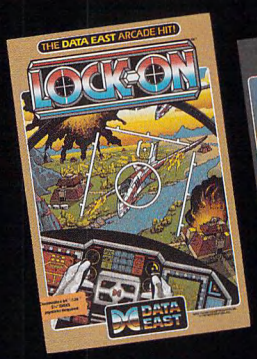

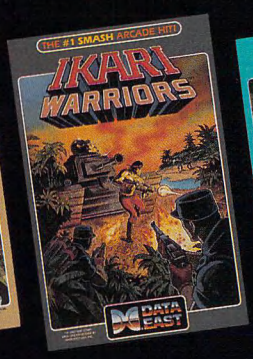

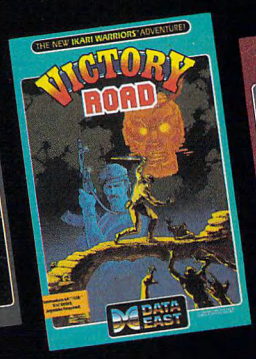

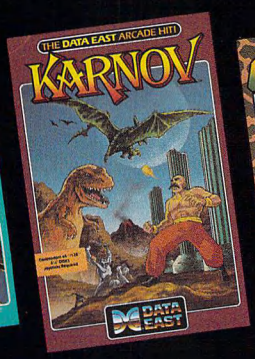

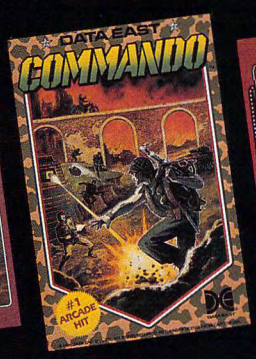

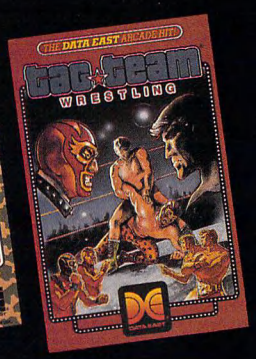

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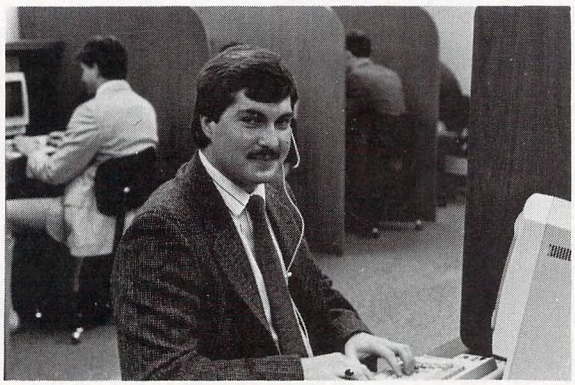

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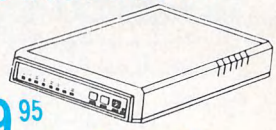

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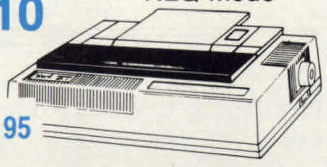

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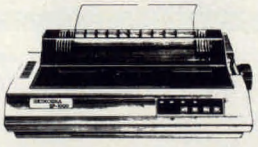

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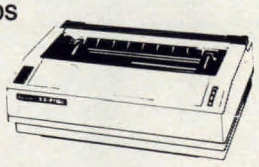

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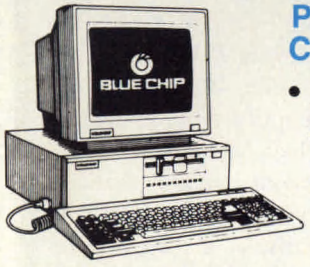

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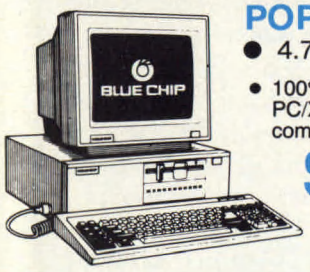

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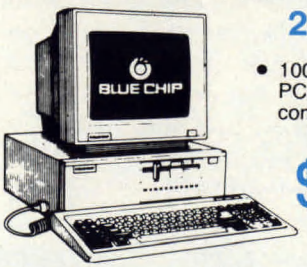

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combines these elements within a high-tech, science-fiction scenario. It succeeds in being both different and fun, demanding strategy rather than joystick skills. You get many chances to hinder your opponents as well as to develop your own winning strategies.

Because of this, *Robot Rascals* is a game that probably never plays the same way twice and should provide many hours of fun. That some elements of the game are recognizable only serves to help you develop a quick familiarity with the action. It is the combination of elements that matter and, in *Robot Rascals,* the combination works.

Robot Rascals
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
$39.95

Instant Pages

W. Fred Schnibben

System requirements: Any IBM PC, AT, XT, or compatible with at least 256K of memory, DOS 2.0 or higher, a printer, and one of the following display cards or its equivalent—color/graphics adapter (CGA), enhanced graphics adapter (EGA), or Hercules graphics adapter (HGC).

Somehow, the forms you buy from the office supply store are never quite right. They are sometimes adequate, and most of the time they serve the purpose, but don't you wish you could add a few lines or make a change here and there? Of course you could always go to the print shop and have the changes made, but the cost of custom forms is enough to take your breath away.

Instant Pages may be just what you've been looking for. It should bring a modest form of desktop publishing into the offices and onto the desks of even the smallest businesses. Cost and complexity are no longer excuses for not doing your own forms and publishing your own newsletters. Robert P. Plummer, who created *Instant Pages,* has delivered an easy to use program at an easy to spend price.

Page One

First impressions are always important, and I was first amazed at how easy it was to install and operate this program. With help from the manual, it took only a few minutes to install on my hard disk. I then found that, even without reading further in the manual, I quickly became familiar with what this powerful tool could do. Help screens are readily available to answer questions, and a pull-down command screen makes it easy to move from one job to another.

The program allows you to create the forms on your monitor—what you see is what you get. You can create professional-looking newsletters, forms, charts, and diagrams in a flash.

The text editor includes such features as word wrap and automatic formatting. If you like, you can read ASCII files made with other text editors or word processors. You can also use any of the computer's special graphics characters for special effects or special applications. Then, with your dot-matrix or laser printer, you can get high-quality results on paper, ready to use.

OnScreen Tutor

Although you can almost use this program without reading the manual, Chapter 2 explains all the basics and should be required reading for everyone. Chapter 3 is an introduction to the disk-based tutorial, which consists of nine lessons that are short, concise, and easy to understand. Each lesson is described in detail, so if you know which functions will be most important in your particular application, you can skip the irrelevant lessons, or come back later to those you'll need the least. Above all, the tutorial is not a grueling chore, but rather a nice way to become familiar with the program's many commands.

The fourth chapter in the manual is a reference guide listing all of the commands, with examples of each. It also has a detailed explanation of the two processing modes (layout and text processing). The final chapter offers a collection of tips and refinements for applying *Instant Pages.*

The manual's appendix is in three parts, the first of which discusses hardware. I used an Okidata 193 printer, which proved very satisfactory; *Instant Pages* also works with a myriad of other printers, including the Hewlett-Packard LaserJets. There are a few limitations with the LaserJets, so you may want to do some research if you're planning to use one with *Instant Pages.*

The program also works with a variety of mouse controllers; again, check before buying to see if yours is compatible.

Good Form

The second part of the appendix, a "page library" with a large selection of common business forms, suffers from one minor problem. The problem has nothing to do with the form templates—which are great—but rather with the size of the pictures in the manual. The pictures are so tiny that even with a strong magnifying glass, I had a lot of trouble trying to read them.

You can bring each sample form up on your monitor, and they're real time-savers. All of the most commonly used business forms are included. It's like going to the office-supply store and picking from a selection of generic forms, except that you can make any changes you want and print them in your office.

The third part of the appendix has a small selection of clip art, which unfortunately is disappointing in both its quality and quantity.

Still, this is a minor consideration when compared to the many appealing features of the software. For instance, the F1 key brings up a help screen that gets you into or out of almost any situation. Even better, *Instant Pages* lets you write your own help screens. If you want to remind yourself about a problem

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you just encountered, add a note on the help pages. Or, if you want to tell other people in your organization to do a job a certain way, why not leave a message for them on a help screen? The help screens are limited to 3900 characters, but it's still a clever innovation.

Another nifty feature turned up in one of the tutorials. The Alt-F4 keys activate an Undo command. Think how many times, with other programs, you've pressed the wrong key and groaned, "Oh no. . .I just wiped out two hours' work!" With *Instant Pages*, you can reverse that mistake. When you press Alt-F4, you undo the effect of the last command. And as the tutorial points out, "One of the best features of the Undo command is that it is also Undoable." I'm not too sure about the word *undoable*, but I've tried this command, and it's one more innovation in a long list of things I like about this program.

In fact, there are very few things about *Instant Pages* I don't like. It's so well designed, easy to use, and innovative that my overall impression is one of disbelief. It's hard to conceive that such a strong and flexible office tool is available for such a reasonable price.

Instant Pages
Electronic Arts
1820 Gateway Dr.
San Mateo, California 94404
$49.95

Master Ninja

Ervin Bobo

System requirements: IBM PC, XT, AT, or compatible with at least 128K of memory and a color/graphics adapter (CGA) or equivalent hardware.

The first thing to know about *Master Ninja*—especially if you've never played a martial arts game before—is that it offers some of the best graphics and animation you've ever seen on a PC with a color/graphics adapter.

It also has an involved scenario that would do an adventure game proud. As the prologue in the manual explains, long ago the gods created a magical longsword to bring peace and unity to the land. For several hundred years this sword was enshrined in a Shinto temple and guarded by the Iga Ninja.

Now a rival group, the Koga Ninja, have broken into the temple (which probably says something about the effectiveness of the Iga Ninja) and have made off with the magical sword. As the one chosen by the priests and your fellow ninjas, it is up to you to journey to the castle of Sanjo, where you are to retrieve the sword and assassinate the emperor, Sanjo.

True, it all seems rather lawless. After all, the emperor is usually the highest power in the land, and if he wants the sword he should probably be allowed to keep it. Couple this with the fact that you're going to have to fight your way through Koga Ninjas, Samurai warriors, magicians, and miscellaneous other enemies, and you'll probably wish you had simply hung around the temple with the rest of the Iga, making excuses about how the theft wasn't your fault.

But never mind. In this kind of game, the scenario can be given short shrift, for the real object is to get into action and start using all those fancy kicks, throwing stars, and daggers.

Pause for a moment, though, on the pages that tell you how to implement your moves and weapons, for the alternative is a speedy death. Your opponents are deadly—they're skilled at this ancient art.

Sorry, No Ray Gun

You set off on this mission with several disposable weapons—that is, weapons which can be used only once. You have nine throwing stars, two knives, and three pinches of blinding powder. If you can't get the job done with that, you'll have to resort to the 20 martial arts moves—most of them offensive—with which you can pummel your adversary while he's pummeling you.

Since the moves and weapons are activated by your actions on the keyboard, it's advisable to approach *Master Ninja* with a clear head and the booklet opened to the quick-reference page. For example, the three blocking moves are made by pressing the A, S, and D keys; to roll forward, you press 9 on the keypad—unless you want to roll backwards, in which case you press F.

Some moves are more mnemonic. For instance, to duck, press 2 on the keypad (which is also the cursor-down arrow); to jump upward, press 8 on the keypad (cursor-up).

You must learn these moves well, for conserving your weapons is an important part of the strategy of *Master Ninja*. As in a text adventure, each room in the game is a combat puzzle with an optimum solution. If you can immobilize an opponent with a kick, save the knives

and stars for those times when no other weapon will do the job.

A Game *Noir*

An interesting split-screen effect contributes to the high quality of the graphics and animation in *Master Ninja*. The upper third of the screen may show details of the room you've just entered, such as a beautifully painted wall, and it's drawn in perspective so the lower part of the screen—a black floor—does not seem out of place.

This black area is the arena. Both your ninja and your adversary are wire-frame figures of different colors. If you were expecting solid figures, keep in mind that wire-frame animation is much faster. Solid figures would be too difficult to animate at a reasonable speed on a PC. (Since both ninjas are wearing black suits and fighting on a black floor, maybe we're lucky we can see them at all.)

Nevertheless, the animation is beautiful. Do a side kick and watch your foot flash into the enemy's body. Do a forward roll, and you're behind your opponent before he knows what's happening. In the latter move, you'll see your ninja go into a crouch, roll like a human ball across the floor, then straighten out to full height—but only if you watch closely, for the animation is very fast.

In other scenes, you'll see traditional movie-type over-the-shoulder shots as you approach the castle or a new room. Scenes of less frantic action—such as when a priest tries to spear you—are meant to be over quickly (one way or the other), so they use solid-figure graphics rather than wire frames. This is possible because the priest can execute only two actions, throwing the spear or dying, so he doesn't require the more flexible animation of a ninja.

Fast, Not Frenetic

Thankfully, although the animation is fast, the action isn't nonstop. There are pauses now and then. When you've conquered an enemy, you must decide where to move next. The castle, you see, is a maze. The game instructions provide a map, but only by trial and error can you learn which rooms are safe to enter. The idea is to find the safest and shortest path to the magical sword.

Bear in mind, too, that each blow rained on you is costing you strength. Messages concerning your relative strength appear at intervals. If you happen to conquer the meditation room during your journey, you can regain some of your strength and thus be prepared for the final battle.

The enemy, you'll find, is not easy to vanquish. Remember that while you are doing unto others, they are doing unto you, and a moment's inattention can be your undoing.

Should you meet an untimely end, a message from your teacher or a priest fills the screen, either chiding you for your stupidity or grudgingly congratulating you for having gotten so far. Think of it as an epitaph.

Master Ninja is one of those rare games that challenges both your mind and arcade skills. It's a game of slam-bang action and magic in which your fate may be glorious victory or inglorious transformation into a potted plant. And if you ever do recover that darned sword, you'll probably give it back to the evil emperor just so you can have the fun of going after it again.

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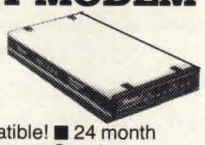

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Font Typesetter

John Klein

Tired of dull-looking letters, memos, manuscripts, and reports? This amazing program turns your dot-matrix printer into a mini-typesetter. You can print any text file using a custom font—whether it's a special font you designed yourself, or one of the 21 fonts included on this issue's disk. You've got full control over font changes, margins, paragraph indenting, line spacing, headers, footers, and more. We've even thrown in a font editor program that makes designing your own custom fonts a snap. The typesetter program works with any IBM PC, PCjr, XT, AT, or compatible with at least 128K of memory and almost any printer; a graphics printer is required to use custom fonts. The font editor program requires a computer with color/graphics adapter (CGA) or equivalent hardware.

Practically everyone who has a personal computer uses it for word processing—whether it's for writing a quarterly business report, a school term paper, an occasional letter to Aunt Maude, or a manuscript for the Great American Novel. And practically everyone has a favorite word processor they regularly use for writing, formatting, and printing out their documents.

But let's consider a slightly different approach. Suppose you continue to use your favorite word processor to write your prose, but then switch to a different program to format the document and print out the finished copy. Suppose this new program gives you full control over the traditional elements of document formatting—such as margins, spacing, headers, footers, and so on—but also lets you use an almost infinite range of custom fonts.

In a nutshell, that's the purpose of "Font Typesetter"—but that only begins to describe the creative potential of this versatile program. You can switch type fonts at will, design your own custom fonts, produce special letterheads with graphics, and much more. In effect, Font Typesetter turns your dot-matrix printer into a minitypesetting system.

Best of all, Font Typesetter works with a wide range of computer systems. The program runs on any IBM PC, PCjr, XT, AT, or true compatible with at least 128K of random access memory (RAM). To use custom fonts, you need a printer that has APA (All Points Addressable) graphics, also known as bit-image graphics. Check your printer manual to be sure. The printer must also use the command sequence CHR$(27) CHR$(76)—ESC L—in order to get 960 dots in the same space normally occupied by 80 text characters. This is usually referred to as double-density graphics mode. Most dot-matrix printers designed for use with PC-compatible computers meet these requirements, though they may need fine-tuning by adjusting DIP switches. More on this later.

Even if your printer lacks graphics, you can still use Font Typesetter to format your documents and access your printer's built-in font styles.

"Font Editor," the program that allows you to design custom character sets, requires a computer with a color/graphics adapter (CGA). Some PC compatibles have the equivalent of a CGA card built into their hardware; check your computer manual if you're not sure.

If your computer isn't equipped with CGA, you can still use Font Typesetter. That's because we've included 21 ready-made fonts on this issue's magazine disk. They're compatible with almost all printers and are ready to load and use.

Getting Started

You'll find the files TYPESET.BAS (the Font Typesetter program), a font code directory file named FONTCODE.DIR., and FONTEDIT.BAS (the Font Editor) on the magazine disk. Both programs must be run from BASIC; they cannot be run from the magazine disk menu. The easiest way to run these programs is to enter this command at the DOS prompt:

```
BASICA TYPESET
```

or

```
BASICA FONTEDIT
```

Alternatively, you can run BASIC by typing BASICA at the DOS prompt, and then run the program with the command RUN "TYPESET" or RUN "FONTEDIT". To exit the program, most of the time you can press the Esc key, but not in certain situations. If you want to stop the program in one of these situations, hold down the Ctrl key and press the

Break key.

The magazine disk also contains 21 ready-made font files (these are not shown on the disk menu). The filenames for these are listed in a box accompanying this article. When you copy these font files to another disk, be sure to copy the file FONTCODE.DIR as well. Each disk that contains font files must always contain this font code directory file, just as the magazine disk does. See the accompanying article, "Designing Custom Fonts," for further information about creating and using your own font code directory file.

The rest of this article describes how to use Font Typesetter. For instructions on using Font Editor, see "Designing Custom Fonts."

Comma Commands

Producing attractive documents with Font Typesetter requires a few simple steps. First, you write your text with your favorite word processor as usual. But instead of embedding the format commands required by the word processor, you insert special *comma commands* that will be recognized by Font Typesetter. Next, you save your document on disk as a plain ASCII text file. Finally, you run the Font Typesetter program and make your printout.

Which word processors are compatible with Font Typesetter? Practically any word processor or text editor will work—even the simple EDLIN.COM line editor found on your DOS disk. The only requirement is that the program must be able to save files in plain ASCII text format. Sometimes this is known as a "print to disk" option. Check your word processor manual if you're not sure how to do this.

All font changing and formatting is done with Font Typesetter's comma commands. These commands control everything from margin widths to line spacing to headers and footers. There's even a special comma command that allows you to turn off Font Typesetter's formatting.

Each comma command takes up one line in your ASCII text file. Any text that follows a comma command on the same line is ignored when Font Typesetter prints out the document. A comma command begins, logically, with a comma. The comma must be the first nonspace character on the line. The actual command must immediately follow the comma and can be entered in upper- or lowercase. There can be any number of spaces between the command and the number or *font call-code* (font specifier), which may follow.

Following is the list of comma commands understood by Font Typesetter. In a moment, we'll explain how each of these works.

,pi (regular indented paragraph follows)
,pb (block paragraph follows)
,pr (reverse indented paragraph follows)
,pa (all indented paragraph follows)

,in *n* (set indent of *n* characters; default = 5)
,ss *n* (set line spacing at *n* lines per inch; default = 6)
,sp *n* (set line multiple spacing at *n*; default = 1)
,lm *n* (set left margin at *n* inches from left side of page; default = 1)
,rm *n* (set right margin at *n* inches from right side of page; default = 1)
,bm *n* (set bottom plus the top margin at *n* inches; default = 2)
,wp *n* (set width of page at *n* inches; default = 8)
,lp *n* (set written page length to *n* inches; default = 9)
,pg *n* (set current page number to *n*)

,sk *n* (skip *n* lines)
,ce *n* (center next *n* lines of text)
,lc *n* (place a solid line *n* inches long in center of next line)
,ll *n* (place a solid line *n* inches long at left margin)
,fb (force a page break)

,lf ***font call-code*[−*options*]** (change line font to *font call-code*, with possible *options*)
−***options*** (each option preceded by a hyphen -):
−**D***num* (double strike *num* down)
−**R** (reverse font, white text on black)
−**H***num* (horizontal expansion, *num* between 1–9)
−**V***num* (vertical expansion, *num* between 1–4)

,hd ***font call-code*[−*options*]** (header)
,ft ***font call-code*[−*options*]** (footer)

,ls (list format until next comma command, place at left margin)
,nf (no format until next comma command, single spaced)

There are also two types of embedded line commands which allow in-line standard font changes and page numbers. These will be described later.

Paragraph Commands

The paragraph comma commands (pi, pr, pb, and pa) format and print a paragraph of the text that follows. The paragraph command must immediately precede the text for the paragraph—do not put any other comma command between a paragraph command and the text for the paragraph. Each line of text is printed with the font specified by the last font call-code command, and within the left and right margins you specified with the margin commands. Your word processor doesn't have to rejustify each paragraph of your document with different margins each time you change font sizes—which saves time. In fact, as you'll see, all of the comma commands save you time.

When you print your document, a paragraph comma command creates a paragraph out of the text that follows the command, until another comma command is encountered. Each sentence is separated by two spaces, and the paragraph is indented, as you specified with the paragraph commands. The following are examples, shown just as you would enter them into your document.

,pi

This creates a *regular indented paragraph* by indenting the first line and placing the succeeding lines at the left margin.

,pr

This creates a *reverse indented paragraph;* the first line is placed at the left margin and the rest of the paragraph is indented.

,pb

This creates a *block paragraph* by placing all lines at the left margin (no indenting).

,pa

This creates an *all-indented paragraph* in which each line is indented from the left margin.

Remember, the paragraph comma commands create a paragraph out of *any* text that follows. This text can be in any original format—one sentence per line, already in paragraph format, and so on. As you can see, you don't need a fancy word processor to format paragraphs; Font Typesetter does it for you. Each paragraph must be immediately preceded by a paragraph comma command, unless you use the No Format or List Format comma commands described below.

Set Commands

The set commands (in, ss, sp, lm, rm, wp, bm, lp, and pg) allow you to change such things as page margins, line spacing, and paragraph indenting. Follow each command with a space and then a number representing the desired new value.

Almost all of the set commands have a *default* value; that is, a value that is automatically in effect unless you change it. Therefore, there's no need to include set commands in your document unless you want to change their values. Paragraphs will always be indented five spaces, for instance, unless you embed the set command *in* to change it.

Here are some examples, shown exactly as you would enter them in your document.

,in 3

This changes the paragraph indent to three characters. The default is 5.

,ss 4

This sets the line spacing at four lines per inch. The default is 6; the minimum allowable spacing is 10 lines per inch. The double-tall and triple-tall fonts that are possible with Font Typesetter actually take up twice, or three times as much space per line, so the command *,ss 6* will print three and two lines per inch, respectively.

,sp 2

This sets double spacing. The default is single spacing. For triple spacing, you would use the command *,sp 3*.

,lm 1.5

This sets the left margin 1½ inches from the left edge of the page. The default is 1 inch. (Note: The left, right, and bottom margins are expressed in inches instead of characters to allow consistent margins when changing font sizes. No matter which font size you choose, the margins will be perfectly straight.)

,rm 1.5

This sets the right margin 1½ inches from the right edge of the page. The default is 1 inch.

,bm 3

This sets the bottom margins *and the top margins* 1½ inches from the bottom and top edges of the page. In other words, the bottom and top margins are always the same, and added together, they equal the value given in the bm command. The default is 1-inch margins, which corresponds to the command *,bm 2*.

Since you never specify the top margin individually, you must position the printhead of the printer where you want the first line of text to appear on the page. Set the top-of-form on the printer to this head placement. Do this by either turning on the printer *after* positioning the printhead or by pressing the TOF SET button on your printer, if it has one. The bm command then sets the number of inches between the written text on each page.

,lp 8

This example sets the *written length of the page* (the length of the area in which text fits, exclusive of margins) to eight inches. The default is 9, which leaves room for 1-inch top and bottom margins on standard-size 8½ × 11 inch paper.

Note that since the lp and bm commands both affect the written page length, they can cancel each other. The most recent command issued is the one that takes effect.

For instance, let's say you're using standard-size 8½ × 11 inch paper, and you issue a *,bm 4* command to set the top and bottom margins at two inches. This means the written length of the page—the area remaining for text—is seven inches (11 − 4 = 7). Now, farther in the document, let's say you embed the command *,lp 8*. This specifies a written page length of eight inches, which leaves room for top and bottom margins of only 1½ inches each (8 + 1½ + 1½ = 11). Since this conflicts with the two-inch margins specified by the bm command, the lp command overrides and cancels out the bm command. But if you were to issue a *subsequent* bm command, it would override the previous lp command.

Because of the way the written page length is calculated from the bm command, use only the lp command to set the written page length if your printer paper is not 11 inches long. Remember, the bm command calculates the written page length by subtracting the number that follows from 11.

Remember, too, that the *written* page length is not the *actual* page length. The written page length is the amount of text that fits on the page. The actual page length is the size of the paper. Therefore, always set the written page length smaller than the actual page length, or you'll have no top and bottom margins.

,wp 7

This example of the wp command sets the width of the page to 7 inches. The right margin is then calculated relative to this width. The default width is 8 inches.

Why is the default width 8 inches when a standard-size sheet of paper is 8½ inches wide? Because printers can print only on the middle 8 inches; they leave extra quarter-inch left and right margins.

The main reason for the wp command is to aid centering. All centering is calculated with respect to the width of the page, not the left and right margins. The page width can be set larger than eight inches if your printer has a larger carriage.

,pg 10

This example sets the current page number at 10. The default is 1. The pg command comes in handy when reprinting certain pages in a long document; it saves you the trouble of reprinting the entire document from the beginning. Page numbers are incremented after each page break.

Line Font Command

The purpose of the lf (line font) command is to change font styles. Font Typesetter prints all text that follows this command in the specified font until it encounters another lf command.

The term *line font* has to do with one limitation of Font Typesetter: All custom fonts are line fonts, which means that you must print an entire line of text in the selected font, not just part of the line. (Exceptions are the font styles built into your printer; more on this later.) The lf command changes the current line font.

The lf command must be followed with the *font call-code* of the font you wish to use. A font call-code is a descriptive label assigned when the font is created with Font Editor, as described in the article "Designing Custom Fonts." (A list of the 21 ready-made fonts on the magazine disk and their font call-codes can be found in a box accompanying this article.)

The font call-code can be placed anywhere after the lf command and can be in upper- or lowercase. Here's an example of an lf command that switches to a custom font with the call code GOTHIC:

,lf GOTHIC

All subsequent text is printed in the GOTHIC font until another lf command is encountered.

Font Typesetter recognizes two types of fonts: the custom fonts created with Font Editor and the standard print styles supported by your printer. The fonts included on the magazine disk were created with Font Editor and, thus, fall into the first group.

If you're using a custom font created with Font Editor, you can follow the call code of the font with any combination of the following options:

−D*num* (double-strike *num* down)
−R (reverse text, white text on black background)
−H*num* (horizontal expansion, *num* range 1−9)
−V*num* (vertical expansion, *num* range 1−4)

Remember, these options are allowed only when using *custom* fonts, not the ones built into your printer. Each option must be preceded by a hyphen, and no spaces can be placed between the font call-code and the options. Here are some examples, assuming you have a font whose call code is GOTHIC:

,lf GOTHIC−D1

This generates double-strike characters. The number that follows the letter *D* specifies how many dots will be placed between the first and second printing pass of each line. A value of 1 or 2 makes the characters appear darker. Larger numbers create a double image.

,lf GOTHIC−R

This option reverses the dark and light areas of your font. With most fonts, this yields white letters on a black background.

,lf GOTHIC−H4

This expands the font horizontally by a factor of 4 (the allowable range is 1–9). During expansion, Font Typesetter flashes an exclamation point (!) on the screen, assuring you that expansion is taking place.

,lf GOTHIC−V2

This expands the font vertically by a factor of 2 (the allowable range is 1–4). Again, an exclamation point on the screen confirms that expansion is taking place.

Built-In Printer Styles

As we just mentioned, Font Typesetter gives you access to your printer's built-in font styles in addition to its own custom fonts. Built-in print styles are ones your printer can switch to without the aid of Font Typesetter—such as italics, underlining, condensed, and so on. These are the styles you're probably accustomed to, and you can continue using them when printing documents with Font Typesetter.

However, Font Typesetter has no way of determining what kind of printer you have, and every model printer has its own built-in styles. To make it possible for Font Typesetter to recognize these styles, you must enter call codes and other information for them at the end of the Font Typesetter program. You don't have to be a programmer to do this, but it does take some care.

Font Typesetter must know five things for each style: a font call-code, an additional single-character call-code, the style's width, the ASCII control code which enables the style, and the ASCII control code which disables the style. The last three items should be found in the printer's manual.

Start by running BASICA and loading the Font Typesetter program, TYPESET.BAS. The lines you add for your printer's built-in styles will be appended to the end of the program. To avoid confusion, it's best to put each style on its own line. The line should start with a line number that's greater than the preceding line number (start with line number 10050). Press Enter after typing each line.

An Example Modification

The following example is for compressed, compressed double-width, and underlining on my printer. Please note that the numbers may be different for your particular printer; the correct numbers can be found in

your printer manual.

```
1010 DATA COMPRESSED,C,17,15,-1,18,-1
1020 DATA DOUBLECOMPRESSED,A,8.5,15,14,-1,20,18,-1
1030 DATA UNDERLINED,U,0,27,45,1,-1,27,45,0,-1
```

Notice how each line begins with a sequential line number and the word DATA. This tells the program that the following information is data, rather than program commands.

The next item on each line is the style's call-code. Type it in upper- or lowercase with no spaces or hyphens. This call code is the one which follows the lf command in the document. The call code can be made as descriptive as you wish, for example;

```
1030 DATA UNDERLINED
```

Follow this with a comma and a single-character call-code. This single-character code is used to change the print style within a line of text—something which is possible only with built-in print styles, not custom fonts. You can use any character for the single-character call-codes except lowercase letters and the backslash (\ ), for example:

```
1030 UNDERLINED,U
```

Next, type another comma followed by the width of the print style. A print style's width is the style's character size measured in characters per inch. For instance, double-wide print is five characters per inch wide, so you would enter 5 as its width. This information can usually be found in the manual that comes with the printer. You can also find out by measuring a sample printout in that style.

Some print styles can have multiple widths, depending on other print styles with which they're combined. For example, underlining and second-strike styles generate text that is ten characters per inch when used as line fonts, but five characters per inch when used for embedded style changes on current line print styles of double-width. To simplify entering the style's width, follow this rule: If the print style in combination with regular ten-character-per-inch text will print in ten characters per inch, the width is entered as a zero. Example:

```
1030 UNDERLINED,U,0
```

Next, follow this with the ASCII control code(s) required by your printer to enable the print style. Again, this information is found in the printer manual. For instance, to switch on underlining, my printer requires an Escape character (ASCII 27), followed by the ASCII code 45, followed by ASCII code 1. So I'd enter 27,45,1. Follow this with a −1, for example:

```
1030 UNDERLINED,U,0,27,45,1,-1
```

Finally, enter the ASCII control codes required by your printer to disable the print style. To disable underlining, my printer requires an Escape character (ASCII 27), followed by the ASCII code 45, followed by ASCII code 0. Follow these numbers with a −1, for example:

```
1030 UNDERLINED,U,0,27,45,1,-1,27,45,0,-1
```

The result is the finished line required to add my printer's underlining style to Font Typesetter.

Note that the last DATA line in the Font Typesetter program must be ENDD, which is currently at program line 19999.

```
19999 DATA ENDD
```

This marks the end of the print style list.

Also, do not erase or place any DATA lines before the DATA line that contains the REGULAR call code. This is necessary to turn off all font styles in your document. Be sure to save the program to another disk when you're finished.

Combining Print Styles

What if you want to combine two built-in print styles—such as compressed and double-width? You might think you could do this by embedding separate line font commands in your document for each style (one for compressed and one for double-width)—but it won't work. Remember, any lf command *cancels* the previous lf command. If you embed an lf command for compressed and immediately follow it with an lf command for double width, you'll merely get double-width, not compressed double-width.

Instead, to combine two built-in print styles, enter a DATA line in the Font Typesetter program that contains the ASCII codes for enabling and disabling *both* styles simultaneously. For instance, to use the compressed double-width style with my printer, I had to enter this line to the program:

```
1020 DATA DOUBLECOMPRESSED,A,8.5,15,14,-1
,20,18,-1
```

DOUBLECOMPRESSED is the font call-code I assigned, and *A* is the single-character call-code. The width of this combined style is 8.5 characters per inch. The ASCII code 15 enables the compressed style, and the ASCII code 14 enables double width. ASCII code 20 disables double width, and ASCII code 18 disables compressed.

Because this single line contains the codes to enable and disable both print styles, I can switch to compressed double-width merely by embedding this line font command in my document:

```
,lf DOUBLECOMPRESSED
```

Changing Styles Within Lines

As mentioned above, Font Typesetter doesn't let you switch to a custom font in the middle of a line of text, but it *does* let you switch to a built-in print style within a line. To do this, you need to use *embedded line commands.*

Unlike comma commands, embedded line commands are typed directly within the text at the point where you want to switch styles. Here's the format for the embedded line commands that change print styles

within a line:

\Xtext\R

where *X* is the previously defined, single-character call-code for the desired built-in print style, and *R* is a constant for disabling the style.

Let's try an example. Assume we've defined underlining with the DATA line, as explained, above:

```
1030 UNDERLINED,U,0,27,45,1,
     -1,27,45,0,-1
```

Notice that the single-character font call-code we've assigned is *U*. To underline the word *jumped* in the following line of text, the embedded line command \U switches on underlining, and the embedded line command \R switches it off:

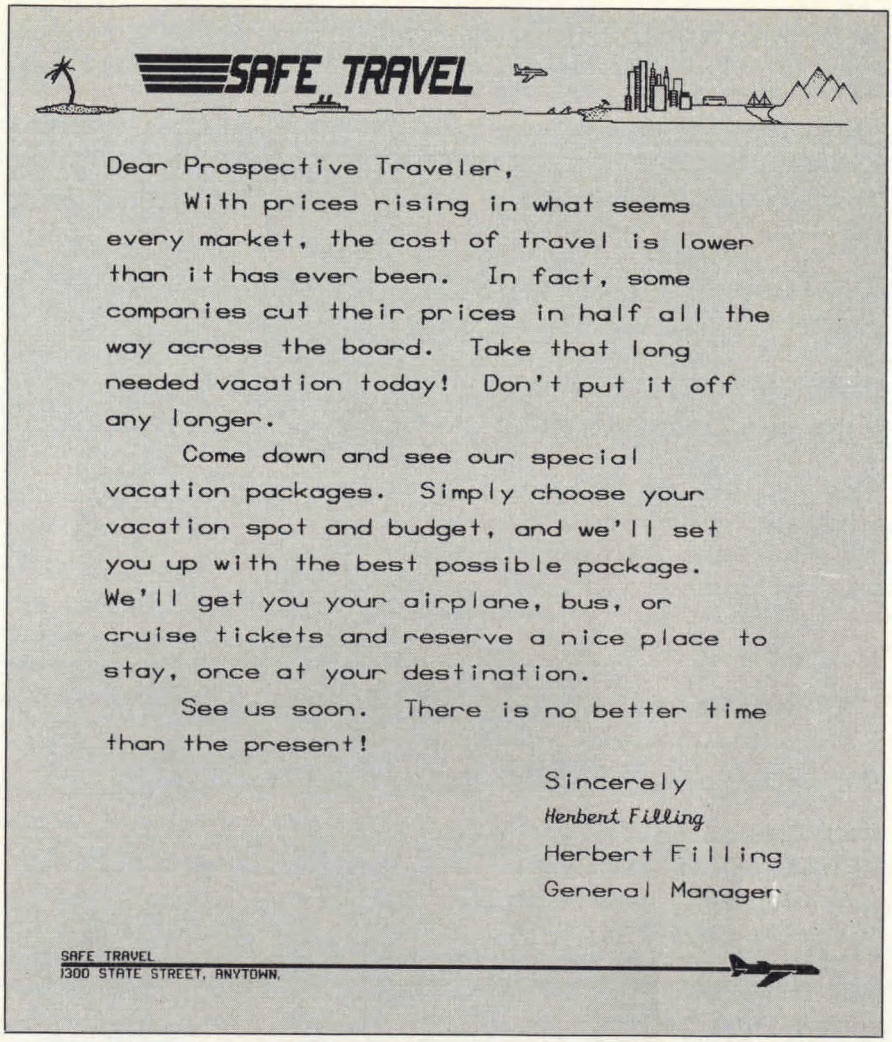
The quick brown fox \Ujumped\R over this lazy dog.

Although it is possible to cancel an embedded print style with a backslash followed by the one-character font call-code of the current line font, it is not recommended. Issuing a line font command also cancels the current print style.

Since these embedded line commands use the backslash character, how do you use a backslash in normal writing without accidentally invoking the command? Simple. If you want to print a backslash in your document, just type two backslashes, one after the other, with no spaces between (\ \ ).

Remember, these embedded line commands are valid only when the current line font is a style built into your printer. They have no effect if the current font is a custom one created especially for Font Typesetter.

Font Typesetter doesn't restrict you to changing the print style of only one word, of course. You can extend the change over many words, change only parts of words, and so on. Furthermore, Font Typesetter takes the width of the new style into account when justifying paragraphs and centering text. Some word processors cannot do this. This is another good reason to use your word processor only for entering text, relying on Font Typesetter to print out finished documents.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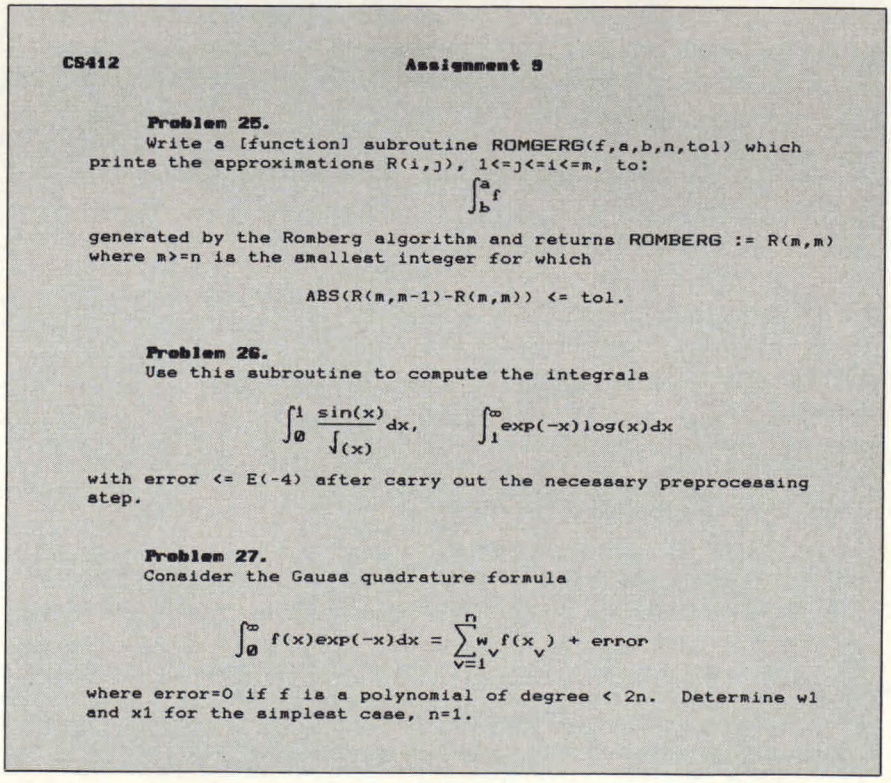

CS412 Assignment 5
Problem 25.
Write a [function] subroutine ROMGERG(f,a,b,n,tol) which prints the approximations R(i,j), 1<=j<=i<=m, to:
$\int_b^a f$
generated by the Romberg algorithm and returns ROMBERG := R(m,m) where m>=n is the smallest integer for which
ABS(R(m,m-1)-R(m,m)) <= tol.
Problem 26.
Use this subroutine to compute the integrals
$\int_0^1 \frac{\sin(x)}{\sqrt{(x)}}dx, \quad \int_1^\infty \exp(-x)\log(x)dx$
with error <= E(-4) after carry out the necessary preprocessing step.
Problem 27.
Consider the Gausa quadrature formula
$\int_0^\infty f(x)\exp(-x)dx = \sum_{v=1}^{n} w_v f(x_v) + \text{error}$
where error=0 if f is a polynomial of degree < 2n. Determine w1 and x1 for the simpleat case, n=1.

Inserting Page Numbers

Another embedded line command allows you to insert a page number anywhere in your document:

```
#page#
```

This inserts the current page number at that point in the line of text.

This embedded command can be used with *any* font, built-in or custom. You can also combine it with the embedded line commands for built-in print styles. Example:

```
The current page number is
\U#page# \R.
```

This would print an underlined page number, assuming *U* has been defined as the single-character font call-code for underlining as explained above.

Format Commands

Font Typesetter has several comma commands for formatting text in addition to the paragraph commands covered previously.

The skip command (sk *n*) prints blank lines in the document, where *n* is a number specifying the number of blank lines; for example:

```
,sk 2
```

prints two blank lines at that point in the document.

If double spacing has been switched on (with the sp command), then Font Typesetter prints two times the number of blank lines specified by the skip command.

The centering command (ce *n*) centers the number of following lines specified by *n* horizontally on the page. These lines are *not* centered with respect to the left and right margins, but to the left and right edges of the page. For example, in

```
,ce 1
A Centered Subtitle
```

the line of text *A Centered Subtitle* will appear centered on the page.

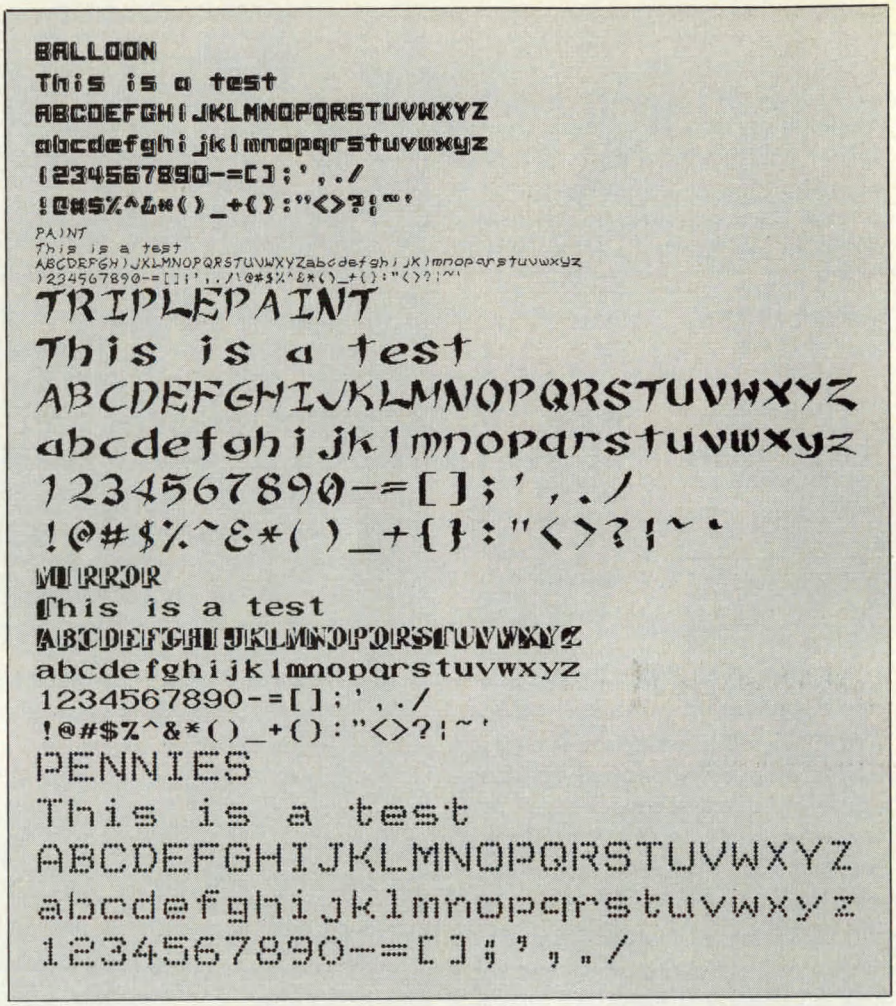
The centered line command (lc *n*) prints a centered solid line across the page where the next line of text would otherwise appear. The length of the solid line is determined by the number substituted for *n*. For example,

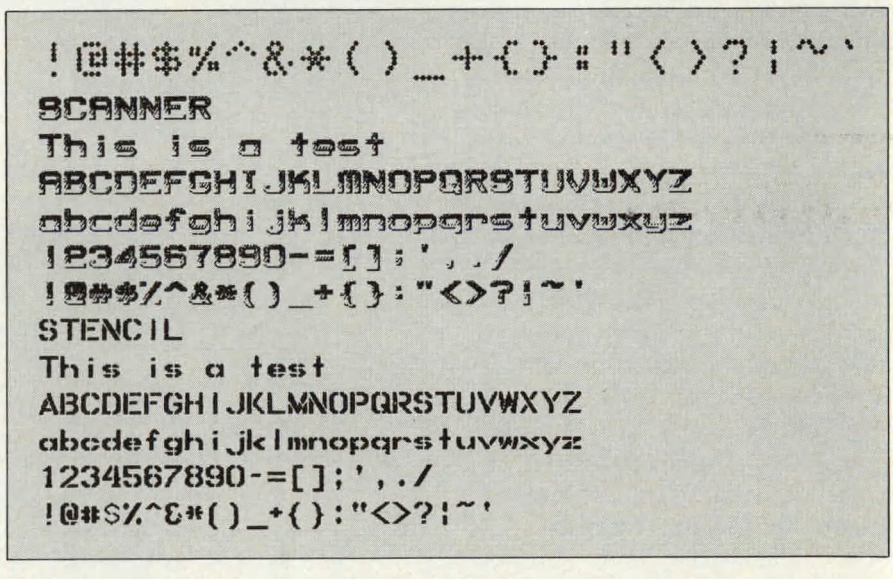
```
,lc 7
```

prints a seven-inch solid line, centered horizontally, across the page. If the document is double spaced, an extra blank line is printed after the solid line.

The left line command (ll *n*) also prints a solid line across the page where the next line of text would otherwise appear, except the solid line is flushed against the left margin, not centered. Again, the length of the solid line is determined by the number substituted for *n*. For example,

```
,ll 5
```





prints a five-inch solid line flush against the left margin. If the document is double spaced, an extra blank line is printed after the solid line.

The forced page-break command (fb) forces a page break. That is, Font Typesetter ends the current page at the point where the fb command is inserted, advances the paper to the next page, and then continues printing. For example,

```
,fb
```

forces a page break at that point in the document. If a footer is active (see below), it's printed before continuing to the next page.

Disabling Automatic Formatting

Two commands are provided to disable most of Font Typesetter's automatic formatting features. Example:

```
,ls
```

This is the list format command. After this command is issued, each line of text that follows is placed, as is, at the left margin.

```
,nf
```

This is the no format command. Text is printed exactly as entered in the document. No format is really Font Typesetter's default format, which means it takes effect when no other format commands are active.

Whether you're using list format or no format, Font Typesetter continues to recognize all embedded line commands, and multiple spacing stays in effect. Both formats are canceled by any other format command.

Headers And Footers

The main purpose of headers and footers is to print the current page number at the top or bottom of each page of the document. Of course, other information can be included in headers and footers, too.

In Font Typesetter, headers and footers are formatting environments by themselves. They can be defined with up to 40 lines of commands and text. If you change to custom font or built-in printer style within a header or footer, Font Typesetter automatically restores the original font or style after printing the header or footer.

Most of the commands discussed above are legal in headers and footers, but some are restricted. For instance, you can't use the skip (sk) and multiple-spacing (sp) commands in headers and footers, and you can't use the paragraph commands to format multiple lines of text—they format only *single* lines of text.

Think before you use the other comma commands. Most things you set with a comma command within a header or footer would affect the subsequent text after the header or footer is printed. Two exceptions are the set-spacing (ss) and left-margin (lm) commands. For instance, if you set the left margin in a header, Font Typesetter automatically restores the original margin after printing the header.

Here is a list of commands permitted in headers and footers.

,pi (one line of text only)
,pb (one line of text only)
,pr (one line of text only)
,pa (one line of text only)
,in *n* (not returned to original setting)
,ss *n* (automatically returned to original setting)
,lm *n* (automatically returned to original setting)
,rm *n* (not returned to original setting)
,ce *n*
,lc *n*
,ll *n*
*****Xtext***\R** (embedded print style)
#page# (embedded page numbering)

Here is a list of commands *not* permitted in headers and footers.

,sp *n*
,sk *n*
,lf *font call-code*

Note that although you can't use the line font (lf) command in headers and footers, you can still print with custom fonts by specifying the font in the header or footer command itself, as shown in the next section.

Header/Footer Definitions

Below is an example of a header definition. Remember that these definitions can be up to 40 lines long.

```
,hd DOUBLE
,lm 6.25
,ls
Manual #2
#page#
,hd
```

The first command (hd DOUBLE) tells Font Typesetter that the lines to come define a header. DOUBLE is the font call-code of the font we want to use in the header. A font call-code must always follow the hd command to set up a header. As with the lf command, the hd command's font call-code can be followed with the −D, −R, −H, and/or −V options, as described earlier.

The next line (lm 6.25) sets the left margin to 6¼ inches. Remember that the left margin is the only margin which is automatically returned to its original value after the header or footer is printed.

The next command (ls) specifies list format—text will be flushed against the left margin.

The next two lines define the text to be printed in the header. The text *Manual #2* will appear on the first line of the header, followed by the current page number on the next line.

Finally, the header definition is closed with another header command. This marks the end of the header. Note that the closing header command is not accompanied by a font call-code.

Footers are defined much the same way. Begin the definition with the footer command and a font call-code (such as *,ft DOUBLE*); add any formatting commands and the text you want; then close the definition with another footer command (without a font call-code).

Font Typesetter Quick Reference Card

Here's a summary of the formatting and font commands permitted when using Font Typesetter.

,pi (regular indented paragraph follows)
,pb (block paragraph follows)
,pr (reverse indented paragraph follows)
,pa (all indented paragraph follows)

,in *n* (set indent of *n* characters; default = 5)
,ss *n* (set line spacing at *n* lines per inch; default = 6)
,sp *n* (set line multiple spacing at *n*; default = 1)
,lm *n* (set left margin at *n* inches from left side of page; default = 1)
,rm *n* (set right margin at *n* inches from right side of page; default = 1)
,bm *n* (set bottom plus the top margin at *n* inches; default = 2)
,wp *n* (set width of page at *n* inches; default = 8)
,lp *n* (set written page length to *n* inches; default = 9)
,pg *n* (set current page number to *n*)

,sk *n* (skip *n* lines)
,ce *n* (center next *n* lines of text)
,lc *n* (place a solid line *n* inches long in center of next line)
,ll *n* (place a solid line *n* inches long at left margin)
,fb (force a page break)

,ls (list format until next comma command, place at left margin)
,nf (no format until next comma command, single spaced)

,lf ***font call-code*[−*options*]** (change line font to *font call-code*, with possible *options*)
−***options*** (each option preceded by a hyphen −):
−**D*num*** (double strike *num* down)
−**R** (reverse font, white text on black)
−**H*num*** (horizontal expansion, *num* between 1–9)
−**V*num*** (vertical expansion, *num* between 1–4)

,hd ***font call-code*[−*options*]** (header)
,ft ***font call-code*[−*options*]** (footer)

X (switch to built-in font style, *X* = single-character call-code)
R (switch off built-in font style)
#page# (insert current page number)

Custom Letterheads

Headers and footers are always single spaced; if you want a double-spaced header or footer, you have to include the extra blank lines yourself as part of the text.

Headers and footers aren't switched on until Font Typesetter encounters the definitions in your document. So if you want the header and/or footer to appear beginning with the first page, the first text in your document should be the definitions. If you don't want a header on the first page, insert the definition after the first few lines of text in the document.

You can design custom letterheads with Font Typesetter by using custom fonts and the solid-line commands (lc and ll). With Font Editor, you can even design graphic shapes or symbols, then simply print them as characters. (See the accompanying figures.) I recommend using the header command to position any custom letterhead designs at the top of the page and the footer command for positioning custom designs at the bottom of the page. This insures that both designs are printed at the top and bottom of each page of the letter.

Printing A Document

Let's assume you've inserted all the proper commands to format your document and have saved it on disk as an ASCII text file. Now it's time to print.

When you run Font Typesetter, it asks you for the name of the file to print. This is the filename of the ASCII text file you've just prepared.

Next, Font Typesetter prompts you for an output device or file. If you want only one copy of your document, let the output device default to LPT1:. If you want multiple copies, see the section below subtitled "Printing Multiple Copies."

After this, Font Typesetter asks which disk drive contains the disk with the font files. This feature allows you to keep font files on a separate disk or many different disks. For instance, your document can be saved on the disk in drive A, and the fonts can be on the disk in drive B. You can also keep fonts in a subdirectory and enter the pathname when prompted for the drive.

If the computer system you're using has only one disk drive and your font files are on a second disk, enter B: for the font-file drive. Font Typesetter beeps twice and displays a message to insert the font library disk or the document disk at appropriate times. Simply insert the disk it asks for.

No matter how many drives you have, if Font Typesetter can't find the required font file on the disk you specify, it displays the following message:

No entry for font call-code in font code directory.
(I) = Ignore font change
(R) = Retry on another font file disk
(E) = Enter correct font call-code

If you press I, Font Typesetter ignores the font change and prints the text in the font that's currently active.

If you put the wrong disk in the drive and want to try again, insert the correct disk and press R.

If you suspect you incorrectly typed the font call-code in the document, press E. This gives you the option of correcting the mistake.

Assuming no more problems arise, Font Typesetter proceeds to print the document, formatting as it goes. If you have a color monitor, all format changes are displayed on the screen in yellow, while the actual formatted document is printed in white.

Font Typesetter beeps to attract your attention if your presence is required for some reason. This happens if it can't find a font file, for instance. A double-beep signals that it's time to swap disks on a one-drive system; if you have two drives, ignore all double-beeps.

Font Files And Call Codes

Here's a list of the 21 font files found in the FONTS subdirectory on the magazine disk, along with their font call-codes.

Filename	Call Code
DMATH.FNT	DOUBLEMATH
BLOCK.FNT	BLOCK
DFAT.FNT	DOUBLEFAT
LBLOCK.FNT	LARGEBLOCK
PENCIL.FNT	PENCIL
BRAILLE.FNT	BRAILLE
BALLOON.FNT	BALLOON
BALL.FNT	BALL
TPAINT.FNT	TRIPLEPAINT
MORSE.FNT	MORSECODE
SYSTEM.FNT	SYSTEM
GREEK.FNT	GREEK
PAINT.FNT	PAINT
FAT.FNT	FAT
MIRROR.FNT	MIRROR
PENNIES.FNT	PENNIES
SCANNER.FNT	SCANNER
STENCIL.FNT	STENCIL
MATH.FNT	MATH
TYPE.FNT	TYPE
TFAT.FNT	TRIPLEFAT

Printing Multiple Copies

If you want multiple copies of the document, enter a filename when prompted for the output file or device. Font Typesetter then creates a file on your disk with the data that normally would be sent to the printer. Important: Make sure you have plenty of room on your disk, because this output file is sometimes quite large.

After Font Typesetter creates the output file on disk, there are two ways to get it to your printer. The first is to use the PRINT command from DOS. This has the advantage of printing the file "in the background" so you can run another program on the same disk while the file is being printed.

A faster way is to use the TYPE command from DOS and redirect the output to the printer instead of to the screen. This prints the file twice as fast. Following are examples of both commands; remember, they are DOS commands, not Font Typesetter commands, so enter them at the DOS prompt:

PRINT *filename.ext*
TYPE *filename.ext* **>LPT1:**

In both cases, substitute the filename and extension of your file for *filename.ext*.

Additional Notes

If you don't own an IBM printer, you may have unexpected gaps appearing in your printouts—particularly with tall fonts—or have trouble with some of the embedded codes or headers and footers. If this happens, consult your printer manual to see if it has an IBM-compatible mode. If it does, set its DIP switches appropriately. *But make sure you write down the current positions of the switches before changing them.* That way you can restore them if you change your mind.

There may be another way to fix the gaps which sometimes appear in printouts made with some printers. Line number 30 in the Font Typesetter program (TYPESET.BAS) contains instructions to advance the printer paper so no gap or overlap forms between the multiple passes the printhead must make to form tall text. If tall text appears to have gaps, change the CHR$(22) at the end of line 30 to CHR$(21) or CHR$(20). If there is some overlap in the lines that form tall text, change this to a CHR$(23) or CHR$(24). Remember to press Enter after editing line 30, and don't forget to resave the program on disk to make the changes permanent.

Font Typesetter's throughput can be improved by compiling TYPESET.BAS with a BASIC compiler. This makes the program run faster, although the speed of the printer is still a limiting factor. Before compiling the program, be sure to make the modifications described in this article: Add the lines required to allow Font Typesetter to recognize your printer's built-in print styles, and, if necessary, correct line 30 as explained in the previous paragraph.

To design your own custom fonts or graphic symbols, see the accompanying article, "Designing Custom Fonts." **PC**

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Designing Custom Fonts

John Klein

This program lets you design your own custom character sets (fonts) for use with "Font Typesetter" in this issue. It runs on any IBM PC, PCjr, XT, AT, or compatible with at least 128K of memory and a color/graphics adapter (CGA) or equivalent hardware.

In addition to using the 23 ready-made fonts included on this issue's magazine disk, you may want to design one or more custom fonts yourself. With "Font Editor," the task of designing custom character sets is made a lot easier. You can design anything from elaborate decorative fonts to character sets for special applications, such as mathematics, the sciences, and foreign languages. You can even make graphic designs and symbols for custom letterheads. Full instructions for using the fonts can be found in the main article, "Font Typesetter."

To run Font Editor, you need an IBM PC, PCjr, XT, AT, or true compatible with at least 128K of random access memory (RAM). The computer must also have a color/graphics adapter (CGA). Some PC compatibles have the equivalent of a CGA card built into their hardware; check your computer manual if you're not sure.

Font Editor is found on the magazine disk under the filename FONTEDIT.BAS. It's a BASIC program, so it can't be run from the magazine disk menu. The easiest way to run it is to copy the file FONTEDIT .BAS to your BASIC disk and enter this command at the DOS prompt:

```
BASICA FONTEDIT
```

Alternatively, you can run BASIC by typing BASICA at the DOS prompt, then run Font Editor from within BASIC by entering RUN "FONTEDIT".

Editing A Font

Font Editor begins by asking you to enter a filename for the font you wish to edit. Each custom font is kept in a separate disk file. The filename must be no longer than eight characters, not including the extension. You should add a special extension such as .FNT to the filenames as a reminder that they contain custom printer fonts.

Each disk that contains font files must also contain a font code directory file named FONTCODE .DIR. If no font code directory is found on the disk, Font Editor creates a new FONTCODE.DIR file. Font Editor also makes the appropriate entries in the font code directory for each new font you create. (The magazine disk includes a FONTCODE.DIR file containing entries for the 23 ready-made fonts on the disk.)

To load an existing font, place a disk containing the appropriate font file in the drive and enter the desired filename. Font Editor loads the file from disk and displays the first character of that font on the screen. If you enter the name of a file not found on the disk or not currently in the font code directory, Font Editor asks whether you wish to create a font code directory entry for the new file. Press Y to create a new font file or to add an existing file to the font code directory; press N to abort the function and return to the original prompt.

If a font file with the specified name exists on the disk but is not in the font code directory, Font Editor allows you to simply add the file to the directory and begin editing. Otherwise, you must create a new font file. In this case, you have two options: You can start with an empty font (all character patterns will be blank), or you can start with a font that is a copy of an existing font.

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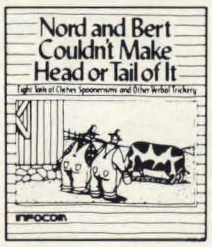

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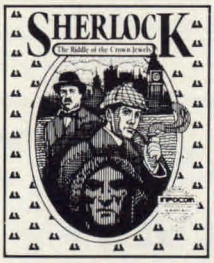

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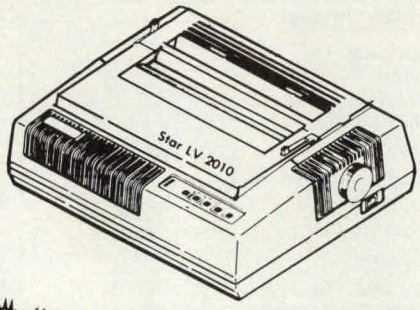

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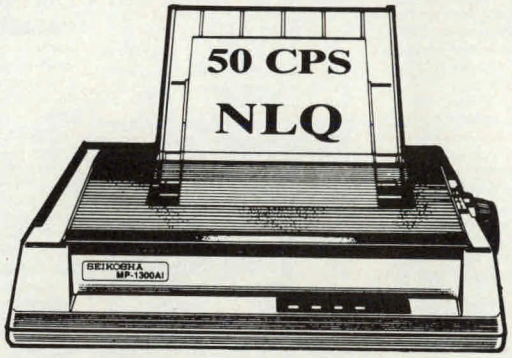

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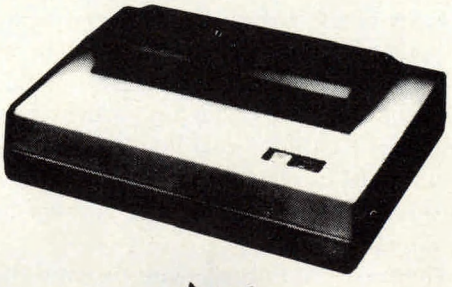

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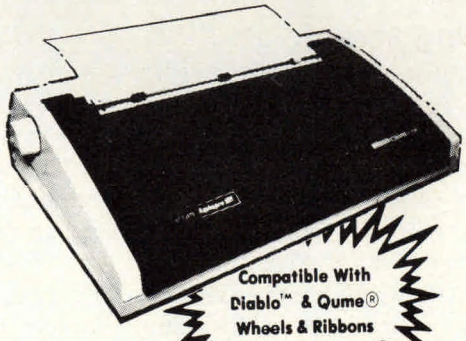

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If you choose the option to start with an empty font, you must answer a few questions before you begin to edit. First, Font Editor requests that you specify the character size in terms of width and height. The character width (in dots) can be any whole number from 4–36. A width value of 12 creates normal-width characters which will print ten characters to the inch on a standard printer. To create half-width characters, you would specify a width of 6. Use a width of 24 for double-width characters, 36 for triple-width, and so on.

After you specify the character width, Font Editor asks you to specify the character height in terms of lines. A character may be one, two, or three lines high. Each line contains eight vertical dots, and the normal printer font is one line in height. A character with a height of two lines is 16 dots high, and one with three lines is 24 dots high—a very large character, indeed.

The next prompt asks you to enter the *font call-code* for this font. This is the code name you use to switch on the font within a document (see main article, "Font Typesetter"). The font call-code can be a descriptive word of any length, but it must contain no spaces, colons, or hyphens. To use a font, you need to remember its call-code, not its filename. The font code directory matches call-codes with filenames.

Finally, Font Editor prompts you to press C if you wish to create a character font or H if you wish to create a *graphics header.* A graphics header, in this context, is simply a picture or graphic design that is built of several individual custom characters. These are useful for designing special letterheads. We'll discuss how to create them later in this article.

Editing Screen

After you answer these questions (or if you began the program by loading an existing font), Font Editor displays the main editing screen. As seen in Figure 1, this screen is divided into two areas. On the left is a list of single-key options used in editing. On the right is the editing window, which displays an enlarged version of the current character.

A custom character set is created by drawing one character at a time in the editing window. Use the cursor keys to move around inside the editing window. If you press the space bar when the cursor is on a blank space, that space is turned on. To turn off a space that is already turned on, simply move the cursor to that square and press the space bar again.

Font Editor allows you to define patterns for the ASCII characters 33–126. These are all the characters that can be entered from an IBM PC or compatible keyboard without using the Alt-key entry mode.

If you're creating a comparatively small font, you can draw each character by moving around the editing window and turning on the dots to represent that character. For larger characters or graphics, you may find it faster to draw each character on graph paper before transferring the design to the computer. Another method is to tape a sheet of clear plastic over the monitor screen and draw on the plastic with washable marking pens and then use the editor to fill in the squares to make up the design. When you're done creating one character, simply wipe off the plastic and proceed to the next.

Character Placement

The placement of each character within the editing window is critical. If you don't align each character in the set properly, the font may look messy or be difficult to read. For most fonts, you'll want to leave white space around characters to prevent them from running into one another and becoming illegible.

Figure 2 illustrates some centering guidelines which yield a pleasing appearance in most cases. Note that all characters except the uppercase *I* should be placed flush against the left side of the editing window.

The exact amount of blank space bordering each character depends on the effect you wish to achieve. In general, you should leave one or two blank lines below the characters to leave room for descenders on the lowercase characters *g, j, p, q,* and *y.* Similarly, the top line or two of space should be reserved for uppercase characters and for the ascenders in the lowercase characters *b, d, h, k, l,* and *t.* Every character should have at least one row of white space to the right.

Editing Options

The left side of the editing screen displays Font Editor's single-key commands:

M	Move to new character
C	Clear editing window
T	Trace from character
S	Save character to disk
I	Initialize font parameters
A	Clear all characters
W	Rewrite screen
R	Restart program
Q	Quit
SPACE	Plot/erase point or cancel current command
D	Turn draw mode on/off
E	Turn erase mode on/off

The move command (M) lets you change which character you're editing.

The clear window command (C) clears the editing window, erasing the current character pattern.

The trace command (T) allows you to copy the pattern of another character in the font into the editing window. This is useful for creating characters that look similar. For instance, to create a lowercase *e* character, you might begin by tracing in the pattern of lowercase *c* (assuming you've already created the *c*). When asked to choose which character to trace, you may either enter the character's ASCII value or simply type the desired character. Note that this command clears the current character before tracing the pattern

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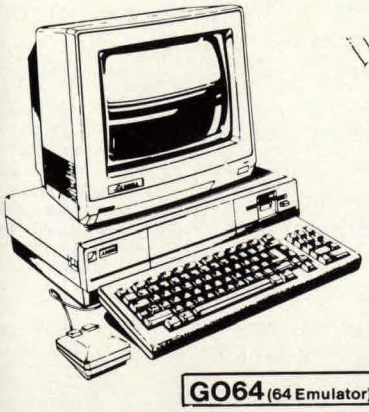

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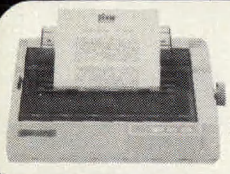

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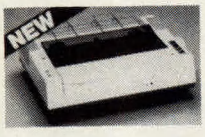

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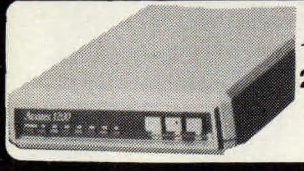

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The save command (S) saves the current character pattern (the contents of the editing window) to the font file. To add the pattern to the font file, you must save it before moving to another character or exiting Font Editor. After you save a pattern, Font Editor automatically displays the next character in the set. Note that all the data for the pattern may not be written immediately to disk when you use the S command. The computer collects the data in a buffer and writes to disk only when the buffer is full. For this reason, it's important to always exit Font Editor with the Q (quit) command. If you press Ctrl-Break to end the program, the last editing changes you made may not be saved on disk.

The initialize command (I) resets the size of the font and allows you to change its call-code. If you change the font size, you'll probably need to use the clear all (A) command to erase any previous character definitions. Character patterns designed for one font size appear garbled when displayed in another size.

The clear all command (A) clears all the characters in the current font. Use this command with care; it's not possible to recover the character patterns once they've been erased.

The rewrite command (W) erases and redisplays the entire editing screen. The editing window is then redrawn with the character pattern from the font file.

The restart command (R) restarts the program. The current character set patterns are cleared and you'll be given the opportunity to choose another font file for editing.

Press the Q key to quit the program and return to BASIC. All saved character patterns are written to disk before the program exits.

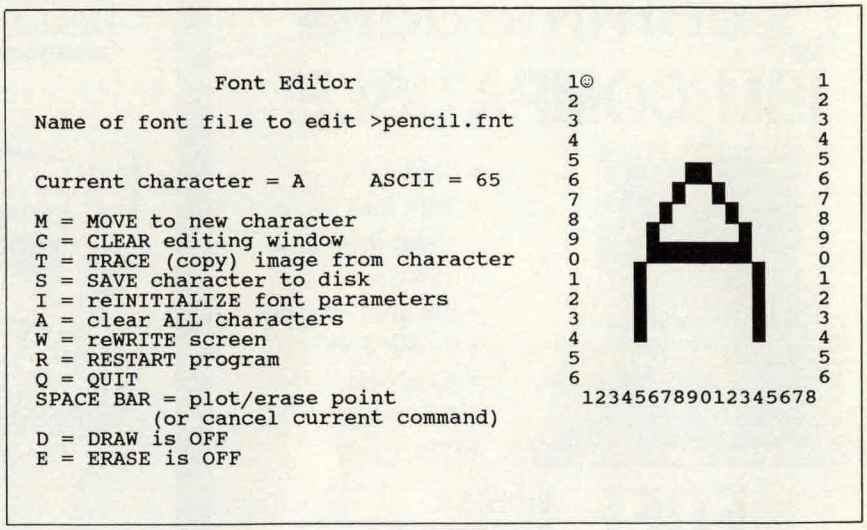
The clear all, restart, and quit commands ask *Are you sure?* before proceeding. Respond with Y to execute the command or N to cancel the command. You can also cancel the clear, trace, and save commands by pressing the space bar while the command is in effect.

The draw-mode command (D) allows you to turn automatic draw mode off and on. When draw mode is on, the cursor automatically turns on every square it moves over. This is useful for filling large areas of the editing window. When draw mode is off, the cursor moves without disturbing anything in the edit window.

The erase-mode command (E) allows you to turn automatic erase mode off and on. When erase mode is on, the cursor automatically erases every square it moves over.

Both draw mode and erase mode are canceled when you draw with the space bar.

Figure 1: Font Editor's Main Editing Screen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T = TRACE (copy) image from character
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A = clear ALL characters
W = reWRITE screen
R = RESTART program
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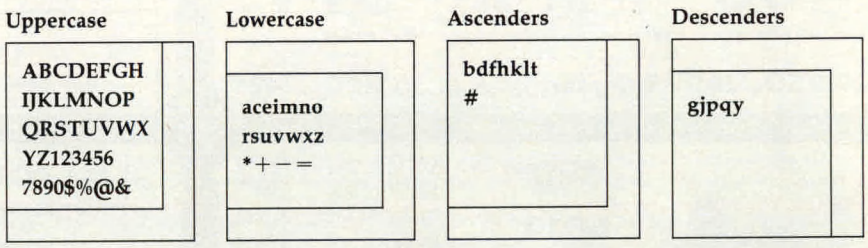
Figure 2: Character Centering Guidelines



Graphics Headers

A *graphics header,* in this context, is simply a picture made up of several custom characters which are designed to be printed in adjacent positions to create a graphics symbol. Don't confuse this graphics header with the text headers that can be printed at the top of every page with Font Typesetter. However, you can include a graphics header in a regular header, thereby mixing graphics and text, as described in the main "Font Typesetter" article.

Perhaps the most common use of a graphics header is to create a letterhead which goes at the top of a page of stationery. (See the example in the main article.) However, you can use this feature to put graphics anywhere on a page.

The first step in creating a header is to decide on its size. You must subdivide the header into blocks of character size. For example, to create a header that is 240 dots wide by 6 lines high, you could use character blocks 24 dots wide by 3 lines high, in which case 20 characters would be required for the header—2 rows

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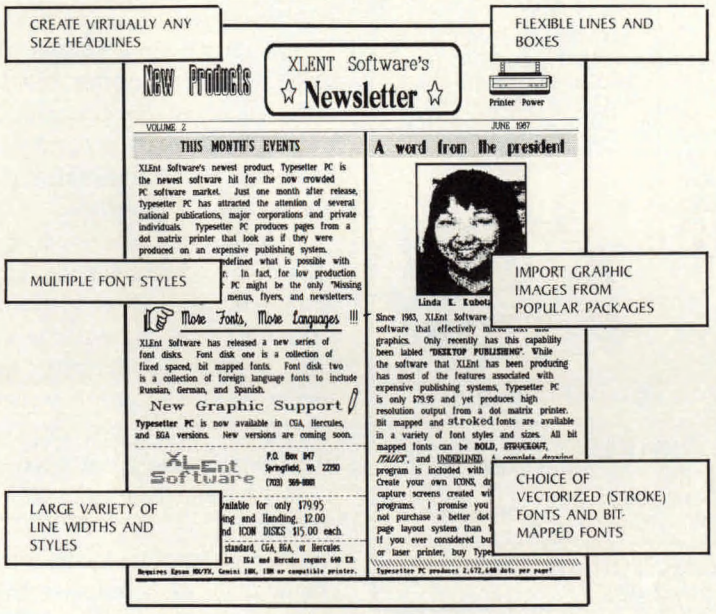

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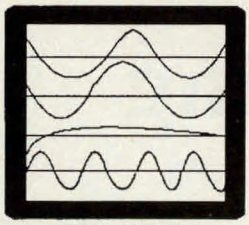

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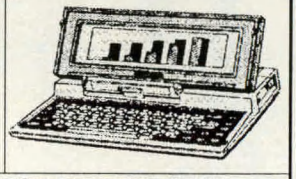

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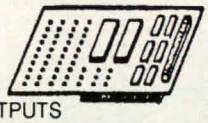

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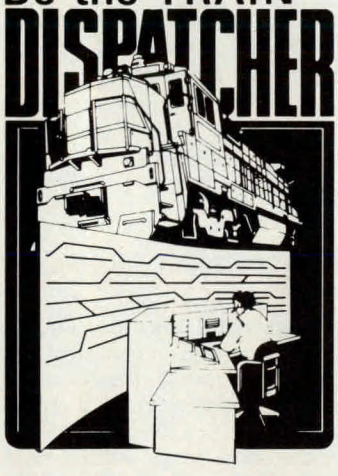

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of 10 characters each. Other character sizes could be used, such as 12 dots wide by 2 lines high, in which case the header must be subdivided into more blocks.

The only restriction is that the complete header pattern can use no more that 94 blocks (only characters 33–126 can be defined). If you use the largest character size (36 dots wide by 3 lines high) and divide the header into 26 characters across by 3 characters high, you can create a header line that is 3 times as high as the largest font style and the width of 80 normal characters, a space about 8 × ¾ inches in size.

If you create a header of the maximum size, the three lines of character blocks can be divided in many different ways. For instance, you might use the upper two lines to create a custom letterhead for the top of a page, and use the remaining line to create a design for the bottom of the page.

Header characters can be created simply by drawing on the editing screen. However, you may find it somewhat difficult to visualize the overall design, since only one character is visible in the editing window. Perhaps the simplest method is to tape together several sheets of graph paper and design the header completely before you begin editing with the font editor. Then decide what portion of the design should go in each character block, and begin filling in the characters.

You'll have an easier time remembering which character blocks comprise the header pattern if you use a sequential series of characters for the pattern. For example, if you subdivide your header design into two rows of ten characters, you might use characters 65–74 (corresponding to *A–J*) for the top row and characters 75–84 (corresponding to *K–T*) for the bottom row. Be sure you remember which characters you used for your design. You'll need this information to print the header later.

Forbidden Character Values

When you save a character, its pattern is converted into a series of numbers in the range 0–255. Two of the 256 possible values create problems when you attempt to write them to disk as part of a file. The tab character (ASCII 9) is written as five space characters rather than as one tab character. Character 26 signifies the end of a file and prevents all subsequent values from becoming part of the file.

If you try to save a pattern containing either of these values, the program shows you which dots in the pattern create the problem number (they will be changed to red), and it gives you a chance to correct them. Simply change one of the offending dots in the vertical column containing a problem pattern and try to save the character again. Fortunately, these values appear infrequently. **PC**

DOS Help

Tim Midkiff, Editorial Programmer

Here's a short but extremely useful program that will probably find its way onto all of your work disks in short order. With a few keystrokes, you can now call up a screenful of information on any DOS command—without hunting for the weighty DOS manual. The program works on any IBM PC, PCjr, XT, AT, or compatible with DOS 2.0 or higher.

When Apple first introduced the Macintosh in 1984, TV commercials boasted how easy the new computer was to use with a dramatic demonstration. Next to a Mac, the slim user's manual was gently dropped onto a desktop; next to an IBM PC, a collection of DOS manuals and reference guides thundered down like a pile of unabridged dictionaries.

Advertising hype aside, there was more truth to the commercial than PC users liked to admit. The DOS command-line interface is a powerful tool, but it's also a pain in the neck at times. There are currently about 60 commands to remember, and each new version of DOS adds a few more. To make things worse, many of the commands have several variations, with switches and other options. Frequent users generally grow comfortable with DOS, but infrequent users more often find themselves at a loss.

For instance, what's the switch that adds a volume name when formatting a disk with the FORMAT command: /V or /N? What does the /A switch do when used with the COPY command? What's the proper syntax for the MODE command when initializing a COM port, and what are the legal parameters? How can you make the SORT command sort a file backward?

If you can't answer those questions without reaching for a DOS manual, you'll appreciate "DOS Help."

DOS Help is a marvelously simple program that puts a miniaturized DOS manual at your fingertips whenever you use your computer. Let's say you can't remember the optional switches for the FORMAT command. All you have to do is type HELP FORMAT at the DOS prompt. In a second or two (even faster if your system has a hard disk or a ramdisk), DOS Help displays a screenful of information about FORMAT: a brief summary of what the command does, an example of the proper syntax, and explanations of the optional switches.

```
A>help copy
COPY /A/B [d1:][\path\][filename.ext] /A/B [d2:][\path\][filename.ext] /A/B/V

Copies file(s) from d1 to d2. Also can rename copied files, combine files, and
transfer files between system devices. Source file is filename.ext on d1;
target file is filename.ext on d2. If you don't specify a new filename.ext on
d2, COPY uses same filename.ext found on d1. Can copy file(s) to same disk if
different target filename.ext is specified.

/A  When used with source filename.ext, treats file as an ASCII text file;
    nothing beyond first EOF character (Ctrl-Z) is copied.
/A  When used with target filename.ext, adds EOF character to end of file.
/B  When used with source filename.ext, forces entire file to be copied.
/B  When used with target filename.ext, does not add EOF character to file.
/V  Verifies that target file was copied correctly. Redundant if VERIFY ON.

COPY /A/B [d:][\path\][filename.ext] /A/B + [d:][\path\][filename.ext] /A/B
  [d:][\path\][filename.ext] /A/B/V

Contents of files are added together and written to specified target file. If
target file isn't specified, files are combined into first file. Several files
can be combined by adding more + [d:][\path\][filename.ext].

A>
```

Stuck on a hard-to-remember DOS command? With "DOS Help," all you have to do is type HELP and the name of the command. Almost instantly, a screenful of information appears.

You can quickly call up similar screens for any DOS command simply by typing HELP and the command name. And if you can't remember a command name, just type HELP. Instantly, DOS Help displays an index of all the commands in DOS 2.x and 3.x.

In addition to its obvious reference and tutorial value, DOS Help is also the most portable mini-manual you'll find. If you have a laptop machine, do you really want to lug around a DOS manual that's almost as bulky and as heavy as the computer? For about 40K of disk space, you can have most of the information about DOS you'll ever need, wherever you go.

Installing DOS Help

To make sure DOS Help is always available when you need it, you must install it properly on your system.

There are two files on the magazine disk you'll need: HELP.COM and HELP.DAT. The first file is the actual DOS Help program; the second is a specially formatted text file containing the DOS reference material. HELP.COM needs to access the HELP.DAT file when it displays a screenful of information.

Copy HELP.COM to any of the disks you commonly use as work disks with your computer. If you have a floppy drive system and you usually keep a DOS system disk in drive A, you might want to copy HELP.COM to that disk. Similarly, if you have a hard disk system, copy HELP.COM to the directory where DOS files are stored—usually the root directory of drive C or a subdirectory on drive C. If you have a ramdisk installed on your system and keep DOS files there, copy HELP.COM to the ramdisk.

Finding a place for the HELP.DAT file is a little trickier. The DOS Help program always searches for this file in the current directory, so there's no problem

if you put HELP.DAT in the same place as HELP .COM and then type HELP while in that directory.

For instance, let's say you have a floppy drive system and keep both HELP.COM and HELP.DAT on your DOS disk in drive A. To request help, you can just type HELP *command* (where *command* is the name of a DOS command, such as FORMAT or COPY). But this works only if drive A is the current drive. If you've switched to drive B (indicated by a B> DOS prompt), you can run the DOS Help program on drive A by typing A:HELP *command*, but DOS Help still looks for the HELP.DAT file on the current drive—that is, drive B. Unless you've also saved a copy of HELP.DAT on drive B as well as drive A, DOS Help won't be able to access the file. Unfortunately, this is a limitation of DOS.

To get around this problem, you can simply copy HELP.DAT to every disk and directory you normally work from. This insures that HELP.DAT is always available to the DOS Help program, no matter what the current directory. However, the HELP.DAT file is about 21K long, and you might not want to waste disk space on numerous copies of HELP.DAT if you use several work disks. Luckily, there's a better way.

The PATH Command

If you're familiar with a DOS command called PATH, maybe you've already guessed the solution. If not, let's review how the PATH command can be useful in a case like this. (Incidentally, this applies to all programs that need to access auxiliary files.)

In DOS lingo, a *path* or *pathname* is a directory specification for a file. In other words, a path defines where a file is located: the disk and the directory. Let's say the floppy disk in drive A contains a file named PROGRAM.COM. If the file is on the root (main) directory, the path is simply A:. If PROGRAM.COM is stored in a subdirectory on drive A called UTILITY, the path is A:\UTILITY. (Notice how a backslash character indicates the name of a subdirectory.)

When you type the name of a program, a disk-based DOS command, or a batch file, the computer normally searches for the file in the current directory. If the computer can't find the file, it displays an error message, such as *Bad command or filename*. Unless you specify the path—such as A:\UTILITY\PROGRAM—the computer can't find the file you're trying to load if A:\UTILITY isn't the current directory.

To get around this limitation, DOS provides the PATH command. With this command, you can specify a list of paths the computer should search if it can't find a file in the current directory. If the computer finds the file you want in the paths you've specified, it goes ahead and loads the file.

Hard disk users are probably familiar with the PATH command. Many people with hard disk systems use PATH to tell the computer where to find DOS system files, usually in a subdirectory on drive C.

Using PATH With DOS Help

Back to the matter at hand. By using the PATH command, you can tell the computer where to look for the HELP.DAT file required by DOS Help.

To see if any paths have already been defined on your system, enter PATH at the DOS prompt. This displays a list of the paths which have been defined to the system by previous PATH commands. If you've never used PATH, there won't be any existing paths, of course, unless someone else uses your computer or sets it up for you.

To define a path to the system, simply enter

PATH *d:\path*

where *d* is the drive specifier and *\path* is the subdirectory name, if any. More than one path can be defined by listing them together, separated by semicolons (PATH *d1:\path;d2:\path* and so on).

For example, assume you've got a system with two floppy drives and you normally keep your DOS system disk in drive A. Copy HELP.DAT from the magazine disk to your DOS disk and define this path:

PATH A:

Now, even if the current directory is on drive B and you enter HELP *command*, the computer knows to look on drive A for the HELP.DAT file. To save you the trouble of issuing this PATH command each time you boot up the computer, insert it into your AUTOEXEC.BAT file.

If you have a hard disk, you might keep your DOS system files in a subdirectory called \DOS on drive C. If so, copy HELP.COM and HELP.DAT from the magazine disk into that subdirectory, and make sure your AUTOEXEC.BAT file has a PATH command that defines C:\DOS as a path.

Users with ramdisks installed on their systems should copy HELP.COM and HELP.DAT to the ramdisk and define that path with the PATH command.

If you're still unsure how to use the PATH command, perhaps the best solution is just to save copies of HELP.COM and HELP.DAT in every directory you commonly use on your work disks. You'll sacrifice a little disk space, but it's still better than tracking down that DOS manual.

Programmer's Notes

DOS Help was written with *FTL Modula-2* by Workman & Associates. If you're interested in studying how the program works, you can find the source code on the magazine disk under the filename HELP.MOD.

Do not attempt to modify the HELP.DAT file with a text editor. To avoid time-consuming sequential searches, the DOS Help program refers to a lookup table to find the matching DOS command when a user types HELP *command*. Modifying the HELP.DAT file will render the lookup table useless and will confuse the program. **PC**

SuperTiler

David Leithauser

Here's a utility for BASIC programmers that adds better color and graphics to programs. "SuperTiler" uses the PAINT statement to create unique patterns which can fill any figure on the screen. You can even create the illusion that you're using more than four colors. It works on any IBM PC, PCjr, XT, AT, or compatible with DOS 2.0 or higher and a color/graphics adapter or equivalent hardware. It also requires IBM BASICA 2.0 or higher or a compatible BASIC.

As most BASIC programmers know, the PAINT statement fills the interior of a figure on the screen with color. Usually, this is a solid color—one of only four which you specify with a number. But you don't have to settle for solids. You can also fill a figure with a complex pattern, a mixture of colors, or both. You can also mix colors to make it seem there are far more than four colors on the screen.

To do this, you need to use BASIC's *tiling* function. It's one of the most under-used BASIC graphics commands, a special variation of PAINT that's available in IBM BASICA version 2.0 and above. The function is called *tiling* because you design a pattern which is rectangular or square. Then the PAINT statement lays these tiles inside a figure, like a mason lays a tile floor.

Most people avoid the tiling function because it's hard to use. To create a complex pattern or mix of colors, you have to create a string of CHR$( ) functions. This string of CHR$( ) functions is actually a bit mask—a pattern of 1's and 0's which determines the color and pattern of dots on the screen.

Ordinarily, you have to resort to complicated math in binary, hexadecimal, and decimal notation in order to specify the bit mask to make the pattern you want. This math is hard for most people to do, but now there's an easier way: "SuperTiler."

With this program, you just describe the pattern you want by answering a series of simple questions. Then SuperTiler displays the pattern you've selected and lists the PAINT statement which creates this pattern.

You can copy the PAINT statement from the screen or make a hard copy on your printer. Then, just insert the PAINT statement in your own programs to recreate the pattern.

Using PAINT

First of all, to use the PAINT statement, your computer must have a color/graphics adapter (CGA) or equivalent hardware. If you try to use PAINT on a system with a monochrome display adapter (MDA), PAINT provokes an error. In addition, the tiling function used by SuperTiler requires IBM BASICA 2.0 or higher, or a compatible BASIC. See the PAINT statement in your BASIC manual to determine whether your version of BASIC allows tiling.

Here is the general syntax of the PAINT statement:

PAINT (*x*,*y*),CHR$(*nn*) + CHR$(*nn*)...CHR$(*nn*),*boundary_color_number*

Your program must supply the values of *x* and *y*. These are coordinates of any point inside the area you want to paint. Be sure they fall somewhere inside the figure you're PAINTing, or else BASIC fills the entire screen with the pattern, not just your figure.

The CHR$(*nn*) values—which can be repeated a number of times, as represented by the ellipses—are calculated for you by SuperTiler. We'll cover this in a moment.

The boundary color number is the palette color number of the boundary around the area you want to paint. Since SuperTiler uses either SCREEN 1 or SCREEN 2, it can have a value from 0 to 3, and the color it indicates depends on the palette you choose. For example, if you select palette 0, a number 3 in this position indicates a brown boundary. If you select palette 1, a number 3 in this position indicates a white boundary. For further information on colors and palettes, see the COLOR and PAINT statements in your BASIC manual.

Use this boundary color to draw a line around an area you want to fill with PAINT. Be sure to surround the entire area. If you don't, PAINT leaks out and fills the entire screen with a pattern. Also, be sure the color you use to draw the boundary is the same as the boundary color in the PAINT statement. In other words, if you draw a brown circle with the CIRCLE command, be sure the PAINT statement which fills it specifies a brown boundary. If these colors are different, PAINT won't fill the proper area.

SuperTiler generates the list of CHR$( ) functions in the PAINT statement. They make up the bit mask which determines the pattern and color of the fill. After SuperTiler lists the PAINT statement that generates the pattern on the screen, it asks if you want to try another pattern. Press Y to rerun the program, N to end SuperTiler.

Starting SuperTiler

You'll find SuperTiler on the magazine disk under the filename SUPERT.BAS. You'll also find a demonstration program called TILEDEMO.BAS on the magazine disk. The demo program shows how the PAINT statement generated by SuperTiler can be used in your programs.

When you run SuperTiler, it first asks you which screen you want to use in your program. Press 1 or 2 to choose either the four-color medium-resolution screen (SCREEN 1), or the two-color high-resolution screen (SCREEN 2). The resolution you choose determines which questions SuperTiler asks next. For now, let's see how SuperTiler works in the medium-resolution SCREEN 1 mode. We'll cover how SuperTiler works in SCREEN 2 later.

After you press 1 for the medium-resolution screen, SuperTiler asks you to choose which of the two palettes you want. These are the standard palettes BASIC provides in the four-color mode.

Next, SuperTiler asks which color you'll use for the background. Choosing a background color doesn't set any parameters in the PAINT statement; it's the screen color you'll see your pattern set against when SuperTiler displays it at the end of the program. Therefore, don't pick one of the palette colors for this background. If you do, SuperTiler asks you to choose a different background color. To remind you of the current palette colors, SuperTiler lists them on the screen.

The choice of a background color is also important when you determine the colors of horizontal stripes. See the cautionary note below.

After this, SuperTiler asks which of the palette colors you want to use for the boundary color. Select the color you'll use in your own program to draw the figure to be filled with PAINT. This selection determines the color number that is the last parameter in the PAINT statement generated by SuperTiler. Don't confuse the boundary color with the background color discussed above. The boundary color becomes a part of the PAINT statement—the background color doesn't.

Once you've entered this basic information, SuperTiler prompts you to choose which pattern you want to PAINT with. There are five basic patterns:

- Horizontal stripes. You can choose thin stripes or thick stripes.
- Vertical stripes. You can choose thin, medium, or thick stripes. (Thin in this mode is so thin that the screen merely appears gray.)
- Checkered squares. You can choose small or large squares.
- Shades of gray. You can choose dark, medium, or light gray.

Horizontal Stripes In Four-Color Mode

If you select horizontal stripes, the computer asks how many stripes you want. Enter a number from 1 to 20 and press Enter. (This is one of the few times you must press Enter, since most other input is via one-key entry.)

After you enter the number of stripes, SuperTiler lists the four possible colors and prompts you in turn for the color of each stripe. Respond by pressing a number from 1 to 4. When you've chosen the color for each stripe, SuperTiler displays your pattern. Then it lists the PAINT statement that generates this pattern. When you insert this PAINT statement in your program, it repeats the sequence of stripes vertically to fill any area with the pattern.

These stripes are very thin. You can make thicker stripes by combining two or more stripes with the same color. For example, suppose you want thicker alternating red and green stripes. Instead of specifying two stripes (one red and one green), specify four stripes. Then choose red for the first and second stripes, and green for the third and fourth stripes. This makes thicker red and green stripes.

There is one caution to observe. You can't specify three or more consecutive horizontal stripes which have the same color as the background color you've chosen. If you do, the PAINT statement provokes an *Illegal Function Call* error when SuperTiler attempts to display your pattern. To remind you which color that is, it's always numbered 1 in the list of possible colors. Remember that when you choose a background color in your program, you'll provoke an error message if three or more consecutive horizontal stripes are of that color.

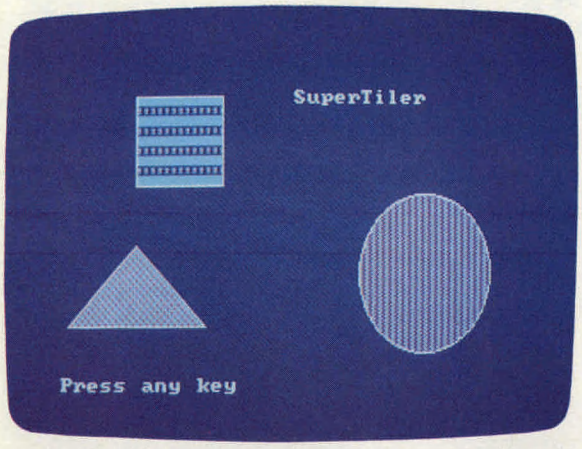
When considering this, remember that the pattern repeats itself vertically, so that the top stripe in your pattern will be below the bottom stripe when the pattern is repeated. For example, suppose there are two green stripes on the top of your pattern, and one green stripe at the bottom. When this sequence of stripes is "stacked up" one on the other, there'll be three green stripes in a row. If green is the background color you've chosen, you'll get an error message when your program executes the line containing the PAINT statement.

Fortunately, such complexities don't arise when determining vertical stripes or checkered patterns. See the following discussion of these patterns.

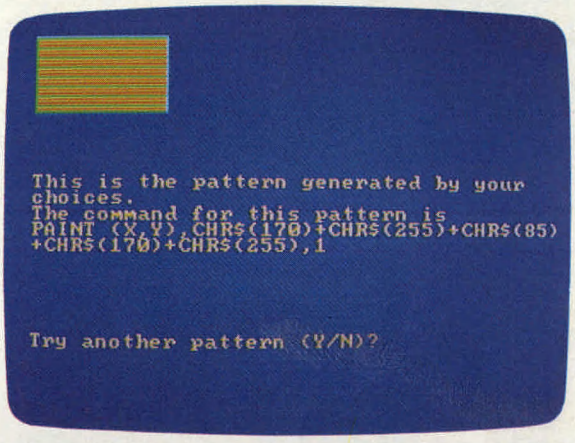
More Four-Color Patterns

The second type of pattern you can select is vertical stripes. This pattern contains four vertical stripes which are repeated horizontally to fill in the PAINT area. Choose a color for each stripe by pressing a number from 1 to 4. If you want only two colors, you can alternate the two colors in the pattern. For example, you might choose red for stripe 1, green for stripe 2, red for stripe 3, and green for stripe 4. You can also make the stripes thicker by specifying red for the first two stripes and green for the next two, and so on.

The third type of pattern is checkered squares. If you choose this pattern, SuperTiler asks how many colors you want to use. If you choose two, SuperTiler



With "SuperTiler," it's much easier to create pattern fills with the BASIC PAINT statement.


This is the pattern generated by your choices.
The command for this pattern is
PAINT (X,Y),CHR$(170)+CHR$(255)+CHR$(85)+CHR$(170)+CHR$(255),1
Try another pattern (Y/N)?

You can even design your own custom patterns with "SuperTiler" and let the program figure out the corresponding PAINT statements automatically.

prompts you for the two colors and then arranges them in a checkered pattern. If you select three or four colors, SuperTiler displays an arrangement of four numbered squares. Then it asks you to specify the color of each square. The PAINT statement generated by SuperTiler repeats this pattern both horizontally and vertically on the screen.

The fourth pattern that SuperTiler can generate is a color mixture. In this mode, SuperTiler mixes the colors as finely as possible to simulate a new color. For example, you can mix green and black to create a darker shade of green, to make dark green shadows on a light green lawn.

If you make this selection, SuperTiler asks you the number of colors you wish to mix. If you choose four, it immediately creates a pattern in which the four colors are mixed equally. If you select two or three, SuperTiler asks you which color to use for each of the two or three colors. Then it asks you to choose what percentage of the space you want each color to cover. You don't choose the percentage for the last color. SuperTiler computes this percentage automatically.

The percentage of space covered by each color is an exact multiple of 25 percent. That is, each color can cover either 25 percent, 50 percent, or 75 percent of the space. For example, you can create a very dark green by mixing 75-percent black with 25-percent green. You can create a lighter green by mixing 50-percent black and 50-percent green, and a still lighter green by mixing 25-percent black with 75-percent green.

Custom Designs

The last option in the color mode is to design your own pattern. This option allows you to precisely mix the colors as you like, or to create a design for the PAINT statement to repeat horizontally and vertically.

When you pick this option, SuperTiler first asks how many vertical pixels you want for your design (unfortunately, you can't set the number of horizontal pixels—BASIC sets it to four). It then lists the four colors you can work with. You'll see a grid representing the pixels, and a window at the bottom left of your screen. It displays the pattern as the PAINT statement would make it.

The initial pattern shows all pixels set to the first color in your palette—not the background color. Here's the reason. If the pixels are initially set to the background color, it makes three or more consecutive horizontal rows having the background color. As explained earlier, this provokes an illegal function call from BASIC.

On the grid you'll see a small circle cursor. You can move it around with the cursor keys. If you press a number from 1 to 4, the square occupied by the cursor changes to the color indicated by that number.

As the squares in the grid change, you'll see the pattern in the lower left corner of your screen change. It mirrors the pattern on the grid. When you have this pattern exactly the way you want it, press Enter. Then SuperTiler lists the PAINT statement that produces this pattern.

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High-Resolution B & W Mode

If you select the two-color high-resolution mode (SCREEN 2), designing tiles is simpler. You don't need to select a palette or background color. SuperTiler goes directly to selection of the four pattern types:

- Horizontal stripes. You can choose thin stripes or thick stripes.
- Vertical stripes. You can choose thin, medium, or thick stripes. (Thin in this mode is so thin that the screen merely appears gray.)
- Checkered squares. You can choose small or large squares.
- Shades of gray. You can choose dark, medium, or light gray.

In each case, when you've made your choices, SuperTiler displays the pattern and lists the PAINT statement that produces the pattern.

If you select custom design, the process is like custom designing in the four-color mode. First enter the number of vertical pixels you want. SuperTiler creates a grid the height of your selection. In the two-color mode, this grid is eight squares wide. In the lower left corner of your screen you'll see an image of the pattern you're constructing. The pattern starts out as solid white to avoid a combination of three consecutive horizontal black stripes. As in the four-color mode, this provokes an illegal function call.

You'll see a cursor (a circle) in one of the squares in the grid. Press the cursor keys to move the cursor over the grid. Press 1 to turn a white square black or 2 to turn a black square white. When you see the pattern you want in the lower left corner of the screen, press Enter to list the PAINT statement which creates the pattern.

As in the four-color mode, you can then press Y to design another tile or N to end the program. **PC**

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Tonto!

Andrew Walsh

Here's a pop-up utility with features both programmers and nonprogrammers will appreciate. "Tonto!" offers a perpetual clock-calendar; an easy way to read and scroll through disk directories without exiting an application program; a printer setup utility that lets you send predefined control codes to your printer; a keyboard scan code reader; an ASCII character table; and a decimal/hexadecimal/octal/binary converter. Tonto! works on any IBM PC, PCjr, XT, AT, PS/2, or compatible with DOS 2.0 or higher. Printer optional.

How many times when writing a program have you thumbed through a manual to find the ASCII code of a character, or the scan code for a key? How often have you scribbled on a scrap of paper or hunted for a calculator to find the hexadecimal or binary equivalent of a number? Have you ever wanted to print a long listing, but couldn't remember how to switch on your printer's condensed mode? Have you ever forgotten the name of a file on your disk, but hesitated to exit from a program to look at the directory?

"Tonto!" is a memory-resident, pop-up utility program that rides to the rescue of these and other problems. Although most of its functions are aimed at programmers, nonprogrammers will find it useful, too. In one compact package, it combines several functions usually found in separate utilities.

Because Tonto! is a terminate-and-stay-resident (TSR) program, you can call it with the touch of a key from within almost any other program. And because Tonto! is written entirely in machine language, it's very small for a program with so many features.

Tonto! runs on virtually any IBM PC, PCjr, XT, AT, PS/2, or compatible with DOS 2.0 or higher, whether you have a color or a monochrome monitor. Tonto! is also designed to live peacefully with nearly all other programs, including other memory-resident utilities.

Tonto! is extremely easy to use. Once it's installed, you can trigger it by pressing Alt-Z at any

Figure 1: Tonto!'s main menu appears when you press the hot key.

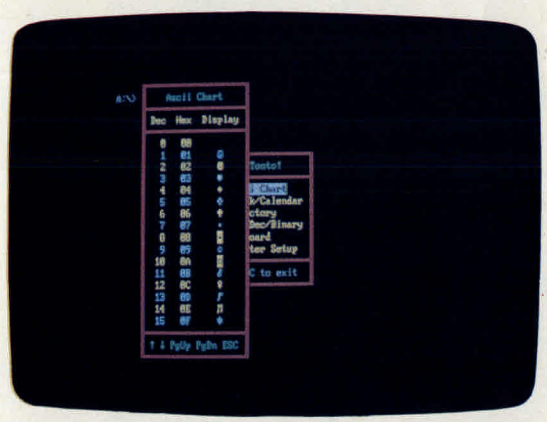

Figure 2: Tonto's ASCII chart lets you scroll through the entire IBM PC character set to look up ASCII codes.

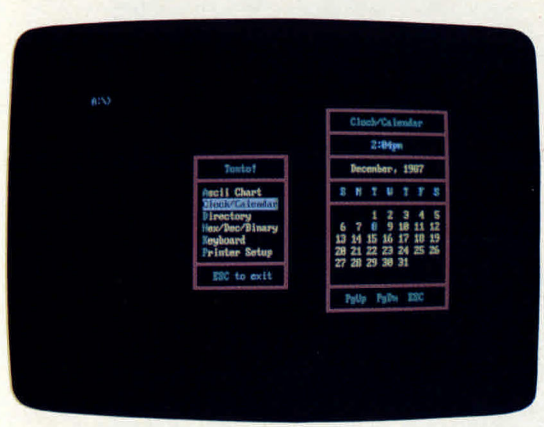

Figure 3: The clock/calendar window displays the current time and date or a calendar for any month of almost any year.

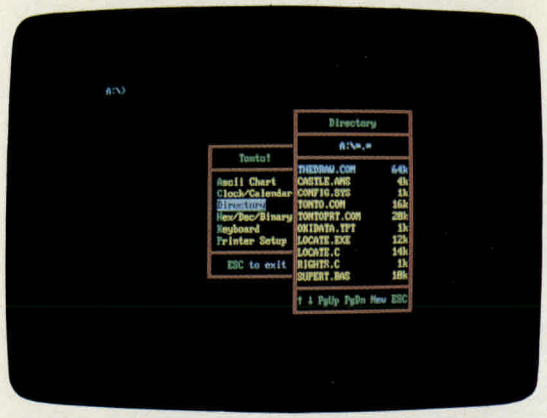

Figure 4: One of the handiest features in Tonto! is the scrolling directory window.

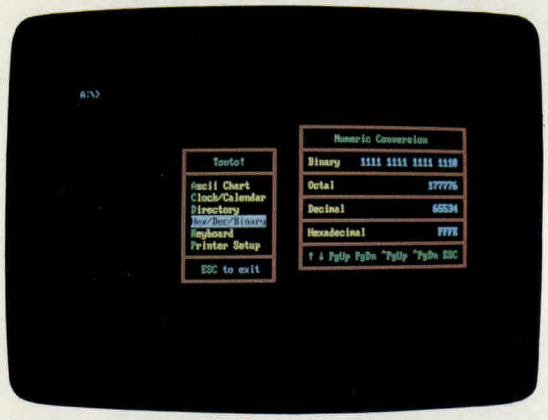

Figure 5: This window lets you quickly convert between decimal, hexadecimal, octal, and binary numbers.

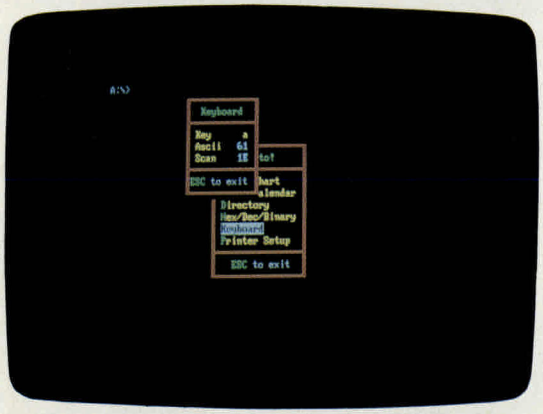

Figure 6: With Tonto!, there's no need to thumb through manuals looking for keyboard codes. Just press any key.

time. (If this causes a conflict with other memory-resident programs, we'll show how you can specify a different Alt–key combination.) When summoned, Tonto! instantly pops open a menu window on your screen, offering the following options:

- A scrolling directory of any disk or subdirectory on your system.
- A clock-calendar that can show any month of nearly any year.
- A printer setup utility which you can customize for any printer.
- An ASCII character table with hexadecimal and decimal representations.
- A number-converter that handles binary, octal, decimal, and hexadecimal.
- A keyboard analyzer that displays the ASCII value and scan code of any key.

Starting Tonto!

You'll find Tonto! on this issue's magazine disk in a file called TONTO.COM. You can load Tonto! from the DOS command line or include it in your AUTOEXEC .BAT file so it installs automatically whenever you boot up your computer. To load Tonto!, enter the following command at the DOS command line (or include it in your AUTOEXEC.BAT file):

TONTO

This installs Tonto! in memory, where it awaits the Alt-Z keypress to call it into action. Once installed, Tonto! remains in memory until you reboot the computer. Tonto! is smart enough, however, to keep you from accidentally installing it twice.

There are several optional switches which can be added to the command line when you first install Tonto!. These switches are like mini-commands which influence the action of Tonto! in some way. In most cases, you probably won't need to include any of the switches. However, they do provide a way to use Tonto! with a printer whose control codes differ from the default values. They also let you change Tonto!'s performance in minor ways.

Here is the command-line syntax for entering the switches:

TONTO [/M] [/S] [/T=*x*] [/P=*filename*] [/H]

The items between brackets are the optional switches; do not type the brackets themselves. You can enter none or all of the switches, and they may be entered in any order in either upper- or lowercase. Separate the switches from each other with at least one space. Here's an explanation of each switch.

/M This switch tells Tonto! to run in monochrome instead of color. Normally, Tonto! senses whether your computer has a color or monochrome monitor and adjusts itself automatically. However, some hybrid monitors (such as those on Compaq portables) imitate a color monitor by displaying colors as

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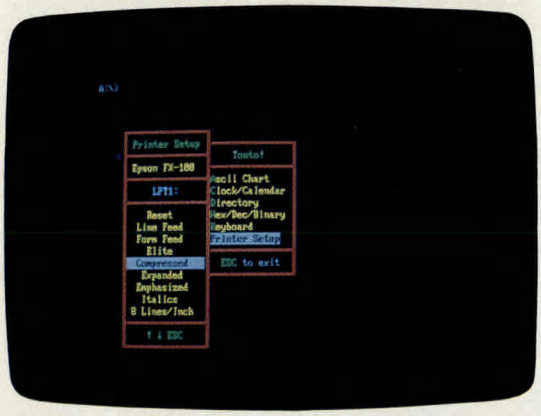

Figure 7: Tonto!'s printer setup window lets you send predefined control codes to your printer.

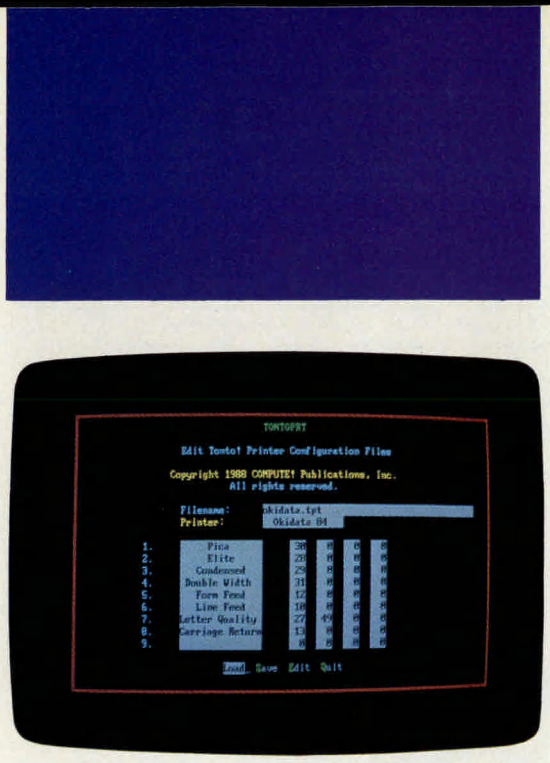

Figure 8: Creating a custom printer configuration file is a snap with the TONTOPRT utility.

shades of green or amber. This may affect Tonto!'s appearance. If you have such a monitor, the /M switch tells Tonto! to run in monochrome, avoiding the negative side effects of hybrid monitors. This switch has no effect when Tonto! is used with true monochrome monitors.

/S Normally, Tonto! prints on the screen very quickly. Some color monitors cannot handle this speed and display an interference pattern that looks like snow. To reduce this effect, Tonto! automatically slows down when printing on the screen with those types of monitors. If your color monitor allows fast printing without snow, you can use the /S switch to remove the delay. The result is a slight increase in speed when Tonto! prints on the screen. Examples of snow-resistant monitors are EGA (Enhanced Graphics Adapter) monitors and the Compaq hybrid monitor mentioned above. The /S switch has no effect when used with true monochrome monitors.

/T=*x* The Alt-Z key combination which activates Tonto! was chosen because the two keys are close together on the keyboard. You may prefer a different Alt–key combination, perhaps to avoid conflicts with another memory-resident program. If so, use the /T=*x* switch and substitute any letter or digit for *x*. The new trigger becomes Alt-*x*. For example, if you load Tonto! with the trigger key set to /T=A, you must activate Tonto! by pressing Alt-A.

If you're running an application program (not a TSR) that uses Alt-Z for some purpose, you can still activate Tonto! with Alt-Z while avoiding conflicts. Just press Alt-Z as you normally would to call Tonto!. Then press Esc to exit Tonto!. Now immediately press Alt-Z again. This time, Alt-Z doesn't call Tonto!—it performs whatever function it did before Tonto! was installed. Tonto! is designed so that you can't activate it immediately after exiting from it—you must press another key first. Still, if you regularly use a program that reserves Alt-Z for some other purpose, it's a good idea to reset Tonto!'s trigger to a more convenient combination.

/P=*filename* Tonto! printer codes default to those used by most Epson and IBM dot-matrix printers. If you have a printer that recognizes different codes, use the TONTOPRT utility (discussed below) to create a printer configuration file. Then use the /P=*filename* switch to pass the filename to Tonto!. You can also include a pathname in the filename.

/H To see a help screen that explains Tonto!'s switches, enter TONTO /H. This displays the help screen without installing Tonto!. You can also enter TONTO /H to display the help screen if Tonto! is already installed.

Special Notes

Tonto! can't be activated when the screen is in the 40-column text mode or any graphics mode. Tonto! senses the current screen mode and won't activate if the screen is in anything other than the 80-column text mode.

Be sure the NumLock key is turned off before you activate Tonto!. Otherwise, the program will incorrectly interpret some keypresses.

The Main Menu

Once Tonto! is installed, it's very easy to use. To activate Tonto!, press Alt-Z or whatever new Alt–key combination (known as a *hot key*) you've defined. The first thing you'll see is a pop-up window with Tonto!'s main menu. (See Figure 1.) From here, you can access any of the program's functions.

There are two ways to make selections from the main menu. You can press the up- or down-arrow key to scroll a selection bar through the menu, then press Enter when the appropriate item is highlighted. Or you can simply press the first letter of the function. To exit Tonto! and return to DOS or the underlying program, press the Esc key. Generally, pressing Esc anywhere within Tonto! takes you back to the preceding menu.

When you select something from the main menu, another window pops open to display that function. The bottom line of each window displays the primary instructions for that window. Now let's take a look at Tonto!'s functions.

ASCII Chart

The ASCII chart pops open on the left side of the screen (Figure 2). It lets you scroll through all of the characters in the IBM PC character set. You can scroll one character at a time by pressing the up- and down-arrow keys, or you can move 16 characters at a time (one full window) by pressing the PgUp and PgDn keys. The Home key returns you to the beginning of the chart, and the End key takes you to the last page. If you scroll past the last character (ASCII value 255), the chart wraps around to begin at ASCII value 0 again.

Incidentally, this use of the up- and down-arrow, PgUp, PgDn, Home, and End keys is common to all Tonto! functions. Some Tonto! modules also use the Ctrl-PgUp and Ctrl-PgDn combinations, which are indicated with a caret character (^). For example, ^PgUp means Ctrl-PgUp.

Press the Esc key to exit the ASCII chart and return to the main menu.

Clock-Calendar

Tonto!'s clock-calendar displays the current system time and month in the top of the clock-calendar window. It also displays a calendar for the month in the lower portion of the window. The date is highlighted on the calendar (Figure 3).

You can view calendars for other months by pressing the PgUp, PgDn, Ctrl-PgUp and Ctrl-PgDn keys. PgUp and PgDn advance (or reverse) the calendar one month at a time, and Ctrl-PgUp and Ctrl-PgDn jump a year at a time. DOS can't display dates before January 1980 or after December 2099, but there are no such restrictions on Tonto!. Although Tonto! won't display calendars beyond the year A.D. 65535 or 0 B.C., you probably won't be scheduling any appointments on those dates, anyway.

To restore the calendar to the current month, press the Home key. As always, the Esc key returns you to Tonto!'s main menu.

Scrolling Disk Directories

Here's one of the most useful features of Tonto!. You can look at a directory or subdirectory on any drive without exiting whatever application program you happen to be running underneath Tonto!. Even if your application program includes a directory command, you'll probably find Tonto!'s scrolling directory window much more convenient.

When you select the directory function from Tonto!'s main menu, a window opens to display a list of the files in the current directory (Figure 4). You can page through the listing with the up- and down-arrow, PgUp, and PgDn keys. The Home key always returns you to the top of the directory listing, and the End key takes you to the last page.

Note that Tonto! shows the file size in kilobytes, rounded up to save screen space. Tonto! even displays hidden files, such as DOS files.

Also note that the first file (or subdirectory) in the listing is highlighted. This feature allows you to get more information about a listed item. If the highlighted item is a file, press Enter to replace the directory with a window of information about that file. This information includes the date and time the file was created, and any special file attributes (hidden, system, or read-only). Press any key to restore the directory listing.

Reading Subdirectories

If the highlighted item is a subdirectory (indicated by <dir> in the file size column), pressing Enter lists the contents of that directory. Now you can quickly and easily examine the contents of any subdirectory on your disk—all while running another program.

DOS subdirectories contain two entries at the top which are denoted by period characters (. and ..). These are usually called *dot* and *double-dot*. The dot represents the current directory; the double-dot represents the parent directory of the current subdirectory. Tonto! takes advantage of the double-dot convention to allow you to move backward through a directory hierarchy.

For example, suppose you're in a subdirectory named \DOS. In the Tonto! subdirectory window for \DOS, press Enter when ..<dir> is highlighted. The window switches to a list of files in the root directory, not the \DOS subdirectory. Pressing Enter when \DOS is highlighted returns you to the \DOS subdirectory.

If you press the N key when Tonto!'s directory window is on the screen, you're prompted for a new drive to display. For instance, type B to display a directory for the disk in drive B. The letter you enter must be a valid drive or ramdisk on your system. Otherwise, Tonto! ignores it. Once you've changed drives, you can move through that drive's directory structure by pressing the Enter key as described above.

Pressing Esc restores the drive and directory that was selected when you activated Tonto!, then returns you to the main menu.

Numeric Conversions

If you select Hex/Dec/Binary from the main menu, the numeric conversion window pops up (Figure 5). The numeric conversion window simultaneously displays an integer in four number bases. These are the four most commonly used by computer programmers: binary (base 2), octal (base 8), decimal (base 10), and hexadecimal (base 16).

When you first enter Tonto!, the number to be converted is set to zero. Pressing the up-arrow key increases the numbers by one, and pressing the down-arrow key decreases the numbers by one. The PgUp and PgDn keys change all numbers by increments of 10 decimal. The Ctrl-PgUp and Ctrl-PgDn keys change all numbers by increments of 100 decimal. The Home key resets the numbers to zero.

The number to be converted is a 16-bit unsigned integer, which means the highest number that can be converted is 65,535 decimal.

Pressing Esc returns you to the main menu. The number remains unchanged should you need to look at it again.

Reading Keyboard Codes

The key-code function complements the ASCII chart. When you select this function, any key you press appears in a window along with its ASCII code and IBM keyboard scan code. Both are shown in hexadecimal. (See Figure 6.)

If you program in BASICA or *Turbo Pascal*, you'll find this function a valuable aid. Unlike other keys, the function keys and cursor keys don't display a character and have no ASCII codes. BASICA treats a cursor or function keypress as CHR$(0) plus the scan code of the key. *Turbo Pascal* treats one of these keypresses as CHR$(27)—the Escape character—plus the scan code. If you want to trap for these keys, you must determine the scan code.

Also, the numbers and arithmetic operators on the numeric keypad have the same ASCII values as those on the regular keyboard, but with different scan codes. If your program needs to differentiate between the keypad and keyboard, you'll need to determine these scan codes. For example, if you want different reactions when the plus on the keyboard and the plus on the keypad is pressed, you'll need to include different scan codes in your program.

Since Tonto! uses the Esc key to exit back to its main menu, you can't press it to determine its scan code. Most programmers don't have to look this up, however; the Esc key is 27 decimal ($1B hex).

Sending Printer Codes

One of the most convenient features of Tonto!—whether or not you're a programmer—is the easy way it lets you send control codes to your printer. Selecting this option presents you with a menu of predefined control codes. Simply press the cursor keys to highlight the appropriate code, and press Enter to send it. Tonto!'s default codes let you issue a formfeed or linefeed, change the print style, or reset the printer to its power-up state. (See Figure 7.)

If you have more than one printer attached to your computer, press 1, 2, or 3 to select LPT1:, LPT2:, or LPT3:. Your printer must be attached properly to the computer, switched online, and loaded with paper. If not, Tonto! issues an error message.

As always, you can press Esc to return to the main menu.

Tonto! assumes your printer is similar to an Epson or IBM dot-matrix printer. These are popular printers, and many others use the same control codes, so you probably won't need to change the default configuration. If your printer isn't compatible with these codes, however, you can still take advantage of Tonto!'s printer setup feature. Here's how to customize it.

The TONTOPRT Utility

You'll find the printer configuration utility on the magazine disk under the filename TONTOPRT.COM. It's a separate program that lets you create Tonto! printer configuration files.

To run TONTOPRT, just enter TONTOPRT at the DOS command line. TONTOPRT displays a menu strip across the bottom of the screen. As with Tonto! itself, you can select any of the four options with the cursor and Enter keys, or you can press the first letter of the option. Here are the options:

Load Bring an existing Tonto! printer configuration file from disk into memory so it can be edited.

Save Write a new Tonto! printer configuration file to disk.

Edit Modify an existing Tonto! printer configuration file or create a new one.

Quit Return to DOS.

Making A Configuration File

To create a new configuration file, you'll first have to decide which control codes you want to be able to send to your printer. You'll find these listed in your printer manual. You can send up to four bytes of code if needed, but most codes aren't that long. Leave unused code fields set to zero. All codes must be entered in decimal (normal base 10 numbers, not the hexadecimal numbers listed in some printer manuals).

You can enter up to nine printer commands with codes and a description of each command. You don't need to use all nine, since any descriptions and codes left blank won't show in the menu. But don't leave empty descriptions in the middle of the list, or Tonto! will ignore any descriptions and codes following the blank entry.

It's easy to edit these fields. First press E for Edit. TONTOPRT prompts you for the text to be displayed

in the printer name field. This is what you see at the top of Tonto!'s printer setup menu. After typing this text, press Enter. Now you can enter the descriptions and control codes. For each entry, simply type the codes you want and press Enter to advance to the next field. You can also press the up- and down-arrow keys to make corrections. (See Figure 8.)

For example, you can set an Epson printer for condensed print by including the following line in the TONTOPRT configuration file:

```
Compressed 15 0 0 0
```

When you finish, press Esc to return to the menu at the bottom of the screen. Save your new configuration file with a filename of your choice.

Learn By Example

A sample configuration file is included on the magazine disk. It's for an Okidata 84 and is called OKIDATA.TPT. Although it may not work with your printer, you can load it to see an example of a properly constructed configuration file. Just select Load from the TONTOPRT menu and follow the prompts.

When you load an existing file, TONTOPRT centers all the text fields and displays the control codes (in decimal) with the descriptions. They appear just as they will when you run Tonto!.

Remember that Tonto! is a memory-resident program which allows itself to be installed only once during a session. If you've already installed Tonto!, you must reboot the computer to reinstall Tonto! with its new configuration file. Don't forget to include the /P=*filename* switch when loading Tonto!. (Example: TONTO /P=OKIDATA.TPT.) Otherwise, the version with the new printer codes won't load.

It's a good idea to include a Reset Printer option in your customized configuration file, just as there is in the default configuration. This makes it easy to return the printer to its normal (startup) state once you've finished with any special type style. Otherwise, you may have to turn the printer off and then back on to return to normal printing mode.

Programming Notes

Tonto! is written entirely in machine language for maximum speed and minimum executable size. The accompanying TONTOPRT utility doesn't need to be fast, so it's written in *Turbo Pascal*. Unfortunately, the source files for these programs are not on the magazine disk; they are so long, they wouldn't come close to fitting in the space available.

Tonto! works by taking over the BIOS keyboard interrupt (INT 16H) and polling it constantly to determine if the hot key has been pressed. If so, control passes to Tonto! from the underlying program. Otherwise, the key is processed as usual. Once active, Tonto! also takes over the DOS critical error handler (INT 24H) and the DOS Ctrl-Break Handler (INT 23H). **PC**

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Hover

Scott Ramsay

Have you ever wondered what it would be like to play tennis with a jet-pack strapped on your back? Perhaps not, but now you can find out anyway. This two-player action game runs on any IBM PC, PCjr, XT, AT, or compatible with at least 128K of memory and a color/graphics adapter (CGA) or equivalent.

Back in the year 2035, many dangerous sports were banned—including boxing, football, hockey, and even golf (which was perfectly safe for the participants, but claimed thousands of TV viewers due to boredom). With nothing more hazardous to watch for entertainment than professional wrestling, sports fans soon invented a new game. It started in secret arenas and quickly spread throughout the world.

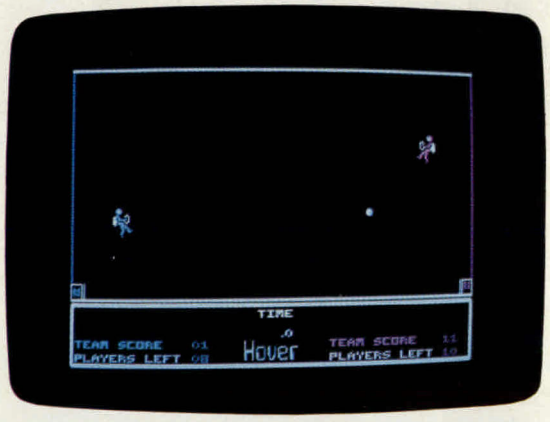
Called "Hover," the new sport was basically a twenty-first century version of team tennis. Each team has ten players, but only one player from each team enters play at a time. As in tennis, the two opposing players swing racquets to hit a ball back and forth, and a missed ball scores a point for the other team.

But there are a few crucial differences between tennis and Hover. In a game of Hover, the players face each other within a walled arena and are equipped with jet-packs so they can fly. And if a player is struck by a ball, he disintegrates.

Despite the obvious dangers, Hover rapidly gained popularity. There's even talk that someday it will be adopted as a new Olympic sport, along with zero-gee bowling and videogaming.

Hover: The Safe Version

Even though it's only 1988, you can play Hover, too—and without risk of disintegration. You'll find the computer version of Hover on the magazine disk under the filename HOVER.COM. When you copy HOVER.COM onto a backup floppy or a hard disk, be sure to copy the files HOVER.PIC and HOVER.SHP as well. All three files must be on the same disk and in the same directory to run the program.



Firing bursts from their jet-packs, two players face off in a hazardous game of "Hover."

Hover runs on any IBM PC, PCjr, XT, AT, or compatible with at least 128K of memory and a color/graphics adapter (CGA). Some compatibles have the equivalent of a CGA card built into their hardware; check the computer manual if you aren't sure. Like other graphics programs, Hover cannot be made to work on a system with a monochrome display adapter (MDA) or equivalent.

If you have an AT-class computer, Hover may run too fast to be playable on your machine. If this is a problem, switch the computer to a slower clock speed, if possible. Many AT-class computers have this capability.

To run Hover, make sure the current directory contains HOVER.COM, HOVER.PIC, and HOVER.SHP; then, enter this at the DOS prompt:

```
HOVER
```

In a few seconds, you'll be greeted by the game's title screen. Press any key to advance to the setup screen.

Beat The Clock

Before starting to play, you must set the game's duration. Hover is played against a clock, and the clock can be adjusted for 50, 75, 100, or 200 time units. (The actual duration of a time unit depends on the

clock speed of your computer.) Press the space bar to move through these choices, and press Enter/Return to make your selection.

In a few moments, the game begins. For the player on the left, known as Player 1, the A key fires the jet-pack and the S key swings the racquet. For the player on the right, Player 2, the K key fires the jet-pack and the L key swings the racquet.

Each press of the A or K key fires one burst from the jet-pack. You can move up or down, but not left or right. Remember that although dangerous sports were banned in the year 2035, the universal laws of inertia and gravity have definitely *not* been repealed. Therefore, the reaction to firing bursts from the jet-pack is not instantaneous, and a few bursts are usually required to overcome the downward pull of gravity and the player's mass.

The ball is served automatically and immediately starts flying toward one side of the screen. If it hits the wall behind a player, the other team scores one point. To block a shot, position your player in the ball's path and press the S or L key to swing your racquet. Be very careful to swing the racquet *before* the ball reaches your player. If the ball hits your player before he raises his racquet, the result is disintegration. This scores five points for the opposing team.

Tips On Strategy

It takes some practice to get the hang of the jet-packs in Hover. Play a few practice games to get the feel of flying. In particular, you need to develop the ability to hover in a certain spot and then quickly zip upward to block a shot without losing control.

Although bouncing off the ceiling generally isn't recommended, a carefully controlled bounce can be a quick way to block a shot aimed toward the bottom of the screen. Relying on the natural force of gravity to drop downward sometimes isn't fast enough, due to inertia.

Don't wait until the last second to swing your racquet when attempting to block an opponent's shot. The ball moves fairly fast, and if you time the swing too closely, you're likely to be disintegrated. If you can't get into position to safely block a shot, you're better off letting it go. A missed ball counts only one point against you, while a disintegrated player costs five points. Remember that if you run out of players, you automatically lose. **PC**

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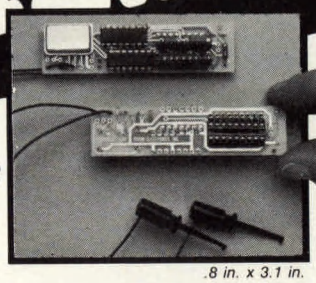

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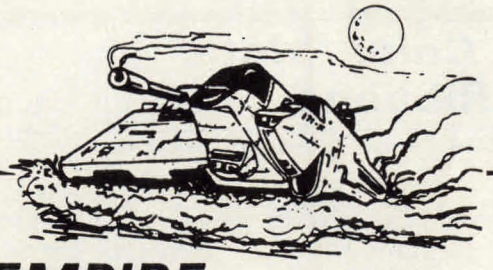

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Before you begin using the magazine disk, we highly recommend making a backup copy and keeping the original in a safe place. Follow these instructions:

Computers with two floppy disk drives: Put your working copy of DOS in drive A and enter DISKCOPY A: B: at the DOS prompt. When DOS prompts you, remove the DOS disk from drive A and replace it with the magazine disk. Put a blank disk in drive B and press any key to make the copy.

Computers with hard disk drives: Put the magazine disk in drive A and enter COPY A:*.* C:*directory* (substituting your own directory name for *directory*). You can specify any directory of your choice, but it must already exist on the hard disk. For instructions on creating directories, see your DOS manual.

Computers with one floppy disk drive: Put your DOS disk in the drive and enter DISKCOPY. Then follow the instructions on the screen.

Running Magazine Programs

Descriptions of all the files on the disk are contained in a file named README. You can display this file on the screen by entering TYPE README at the DOS prompt. Hold down the Ctrl key and press NumLock to pause scrolling; press any other key to resume it. (Some computers have a special Pause key for this purpose.) You can read the file more easily by loading it into your word processor, or by printing it with the DOS command COPY README LPT1.

Before running the disk programs, follow the instructions in the articles. Remember that some files on the magazine disk are not executable programs—for instance, some files contain source code for programs included elsewhere on the disk in compiled, executable form.

Programs That Require DOS

Some programs on PCs and compatibles require COMMAND.COM (a DOS file) to operate. Floppy drive systems look for COMMAND.COM on drive A, so it's best to keep a disk with COMMAND.COM in drive A. If there's room on your backup copy of the magazine disk, you can copy COMMAND.COM onto it and run the magazine programs from drive A. If there isn't room, put a COMMAND.COM disk in drive A and the backup copy of the magazine disk in drive B. Then run the magazine programs from drive B.

If the system you're using has one floppy drive and no hard drive, copy COMMAND.COM onto your backup disk if there's room. If there isn't room, copy some of the programs you want to use from your backup disk to a disk with COMMAND.COM. Then run the programs from this disk.

If the system you're using boots from a hard drive, the computer can find COMMAND.COM on the hard drive. If you boot a hard drive system from a floppy disk in drive A, you should keep a COMMAND.COM disk in drive A.

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Special Notes

When running the "Font Typesetter" program (TYPESET.BAS) in this issue, some users may encounter an error message indicating "too many open files." If this happens, use a text editor or word processor to add the line FILES = 10 to the CONFIG.SYS file on your boot disk. If your boot disk doesn't already have a CONFIG.SYS file, create one on the root directory with a text editor or word processor. For more information on CONFIG.SYS, consult your DOS manual.

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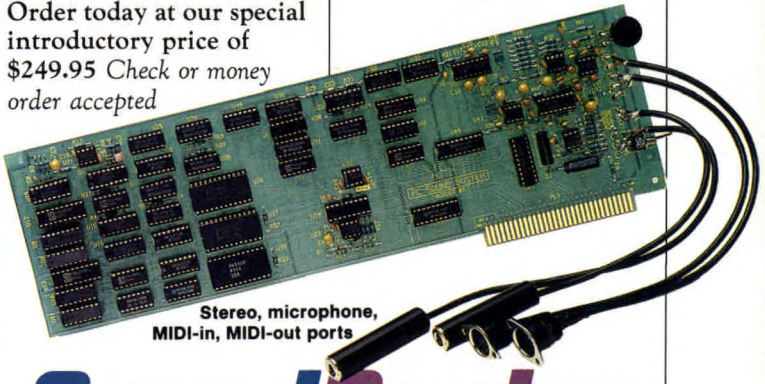

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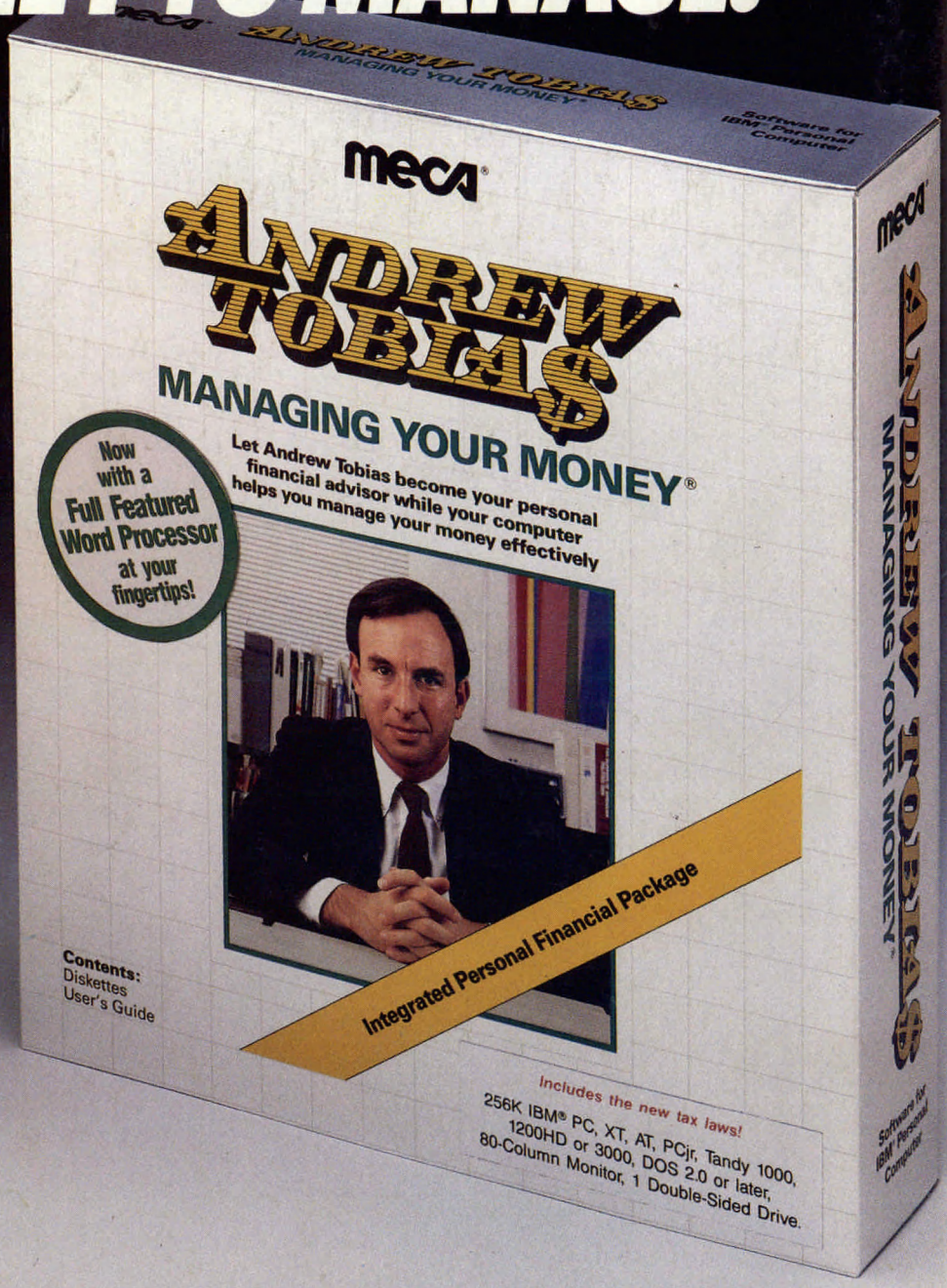
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